LITHOGRAPHIC ABSTRACTS
1948

Monthly Lithographic Abstracts

July 1947 through June 1948

LITHOGRAPHIC TECHNICAL FOUNDATION, INC.

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Process photography—general

***The Kemart Process. Burtt L. Berry. *Photo-Engravers Bulletin* 37, No. 2, September, 1947, pp. 33-39 (7 pages). This is the second of a series of articles dealing with the Kemart Process. The history of the development of the process is reviewed from "glow-in-the-dark" pictures for children to the application of fluorescent materials in the form of a paint which the artist can use in all highlight areas on his work or line drawing. The photo-engraver can automatically obtain a highlight halftone negative by making two exposures on the same negative; one under the "invisible purple" light without a halftone screen; the other with his regular camera lamps and with the screen in position in the camera. Drawing papers can also be treated with fluorescent "dips" so that wherever the paper is not covered by a drawing value, high lighting automatically occurs.**

*OZALID PRODUCTS IN THE GRAPHIC ARTS. *Printing Equipment Engineer* 74, No. 5, August, 1947, pp. 40-43 (4 pages). Principal advantages of Ozalid products in proving and platemaking are: (1) Prints are obtained in a matter of seconds; (2) The entire process can be carried out under ordinary room lighting conditions; (3) True-to-scale or dimensionally stable prints because water is not used in developing; (4) Ability to increase the line of density of original copy and secure an improved negative or positive transparency; (5) Ability to remove imperfections existing in copy from their reproduction on the positive or negative with Ozalid corrector fluid; (6) Prints via Ozalid are immediately ready after making for use; (7) Freedom from "pin holes". The use of Ozachrome in color proofing, and Litholoil for production of transparent proofs or positives for deep-etch platemaking, are described.

*THE OZACHROME COLOR PROVING PROCESS. Ernie Baudhuin. *Modern Lithography* 15, No. 7 July, 1947, pp. 34, 45 (2 pages). Details are given for the process of using three color Ozachrome films and a Dryphoto black print for four color process proving. This process is a great aid in securing more accurate color reproduction more economically. Additional uses suggested for the Ozachrome Process include: map work, duplicate negatives and positives, and layouts employing simple color breakdown and tints such as broadsides, mailing pieces, and catalogues.

* PHOTO-LITHOGRAPHY: REFLEX TECHNIQUE FOR EXACT SAME SIZE. C. C. Redman. *Process Engravers' Monthly* 55, No. 652, April, 1948, pp. 108, 111 (2 pages). The problems involved in the production of exactly same size line work are reviewed. The use of Kodak Heflex Emulsion to solve this problem is outlined. The negatives have sufficient contrast for direct use in platemaking.

***Making Foolproof Blueprints on Old Dry Plates and Film. *Harris Impressions* 7, No. 4, July-August, 1947, pp. 1, 3 (2 pages). A method is described for changing old discarded dry plates and film into usable blueprints. First the silver deposits are removed and plate cleaned. Then the plate is sensitized by bathing in a solution of iron and ammonium citrate. After being properly exposed the blue print is developed in a potassium ferricyanide solution until desired density is obtained. This method of blueprinting requires a few more operations than other methods but its quality and dependability is such that it produces a blue print that will stand up under all retouching and platemaking conditions.**

•BLUEPRINTS ON METAL AND GLASS. *American Pressman* 57, No. 9, August, 1947, pp. 42-44 (3 pages). The four bases on which blueprints are made are: metal plates painted white (Duco), paper plates, grained zinc press plates and glass. Instructions are given for making blueprints on each of these surfaces. Some of the uses of blueprints include: preparing and correcting copy; making simple color separations; registering complex designs of halftone and line (negative or positive); as an outline and guide in making direct drawings on zinc or aluminum press plates;

•A SLIDE-RULE CALCULATOR FOR PROJECTION PRINTING. H. d'Assis-Fonseca. *British Journal of Photography* 94, No. 4550, August 1, 1947, pp. 276-7 (2 pages). The author gives a simplified version of the calculator designed by W. J. Pilkington (*British Journal of Photography*, April 4, 1947). Of the four inter-connected variables affecting projection printing, the three known to the worker are (1) enlarging magnification, (2) nominal lens aperture, (3) negative density, and the aim of the calculator is to provide a simple means of finding the fourth, exposure time. By use of a constant k, to include all factors (other than the first three above) affecting the exposure time in positioning one of the fixed scales with respect to the other, the correct exposure value can be read from the calculator.

Photographic materials

•Use of Glycerin in Photography. Georgia Leffingwell & Milton A. Lesser. *American Photography* 41, No. 11, November, 1947, pp. 30-32 (3 pages). A review of the role of glycerin in photography. Several formulas are given for negative varnish, negative inks, developers, print varnish, adhesives to make "stay-flat" plates or "sticky-back" holders, opaquing solutions, and screen coatings.

Film processing

•Temperature Control in Photomechanical Processing. *Bulletin of the Graphic Arts No.* 9, 1947, p. 3 (1 page). The importance of temperature control in photographic processing and the results to expect from temperatures that are too high, or too low, are discussed. Automatic control devices are ideal for uniform, efficient processing, but since such equipment is not always available to the average plant, simple devices are suggested such as a household water mixer. Care in cooling is stressed and a method suggested. Temperature control produces a definite improvement in quality and significant savings of films, plates, chemicals and production time.

• TEMPERATURE CONTROL – AN AID TO LITHOGRAPHIC PRODUCTION. Franklin M. Morgan. *National Lithographer* 55, No. 2, February, 1948, pp. 38, 107 (2 pages). The author points out the importance of temperature control in photographic processing. The early efforts which led to modern temperature control devices are discussed.

Adjacency Effects in Photography. R. N. Wolfe and R. S. Barrows. *Journal of American Photographic Society*, 1947, 13, pp. 554-6. Several previously known developments effects caused by the interaction of adjacent images are described and the term "adjacency effects" is proposed for the group. The fundamental reason for good agitation during development is to prevent the accumulation of reaction products which result in adjacency effects. *Chemical Abstracts* 1947, 41, 6165; *British Journal of*

Photography 95, No. 4581, March 5, 1948, p. 97.

• INTENSIFICATON OF NEGATIVES. C. an Duijn, Jr. *American Photography* 42, No. 3, March, 1948, pp. 144-147 (4 pages). Negatives that need intensification may be grouped into three classes: (1) Correctly exposed but underdeveloped negatives; (2) Slightly underexposed and underdeveloped negatives; (3) Much underexposed but normally developed negatives.

Various methods of intensifying these classes are described.

• SCUMS, SLUDGES, AND STAINS. J. I. Crabtree and R. W. Henn. *PSA Journal* 14, No. 4, April, 1948, pp. 201-209 (9 pages). Stains and scums may be formed during development, in the rinse bath, during fixing, and during washing and drying. These may consist of (a) impurities picked up from the surface or the body of the solution, including dust, oil, and vegetative growths, (b) residues left on drying, (c) chemically formed scums including calcium sulfite and carbonate, aluminum sulfite, phosphate and hydroxide, silver and silver sulfide, oxidized developer, and precipitated sulfur. The identification, formation, prevention and removal of these defects are discussed and summarized in a group of tables.

Fine Line Developer, *See* I, 19, New Masking Method.

Light sources

M-R. "BRUTE": NEW SUPER HIGH-INTENSITY ARC. P. Mole. *Amer. Cinematographer* 27: 438-39, December, 1946. STUDIO SUPER H.-I. CARBON-ARC LAMPS. P. Mole. *Intern. Projectionist*, 22: 7-9, March, 1947. A new sun-type studio high-intensity arc lamp is described which draws 225 amperes. Improved efficiency is obtained by the use of a curved (presumably meniscus) condenser lens of 24-inch diameter. For process projection in the studios, a 225-amp. arc with f/2 optics provides 30,000 lumens. In this latter case, accuracy of feeding and positioning of the crater is achieved by means of a water-cooled positive-electrode mounting and carbon-feed control by using arc-voltage response and a photo-cell device. Film heating in the projector is reduced by using a water-cell relay condenser and by applying an air blast to the film in the aperture. *Monthly Abstract Bulletin* 34, No. 1, January 1948, p. 22.

Light control

•Exposure Control Is Important in Making Negatives and Plates. Harold Finkle. *Canadian Printer and Publisher* 57, No. 3, March, 1948, pp. 37, 42 (2 pages). The importance of precise exposure control in making negatives and plates.

• MAKE YOURSELF AN EXPOSURE GUIDE. *Lithographers Journal* 32, No. 6, September, 1947, p. 10 (1 page). An exposure guide is described for use in making litho halftones. Instructions for making and using the guide are given.

Voltage Stabilizer Now Used in Litho Industry. C. Falk. *Printing Review of Canada*, 1947, 22 (12), 16-7 (May). The voltage stabilizer delivers a constant output of 230 volts when connected to an ordinary power line whose voltage varies between 190 and 260 volts. Influence of other electrical loads on the voltage output is eliminated. Installation of the stabilizer grew out of a study of the Falk Company of the factors controlling the production of good negatives and prints. It was discovered

that negatives did not produce the same true colors for a given exposure, or, for black and white negatives, the same densities for a given exposure. Further studies showed that voltage variation caused by changes of electrical loads on the building circuit produced colour variations as a result of unequal voltages at the light source. *Printing Abstracts* 2, No. 8, August, 1947, p. 320.

Lenses

PRACTICAL ASPECTS OF LENS FLARE. J. S. McFarlane. *Journal of the Photographic Society of America* 13: 344-52, June, 1947. The causes and types of lens flare are outlined and the effects on picture quality are described. In some cases, there is degradation of shadow detail and loss of color purity in the shadows of color photographs. Since flare caused by reflections from the glass surfaces of complex lenses causes the most trouble, these lenses benefit most from antireflection coatings. The index and thickness of such coatings reduce reflected light by destructive interference. The degree of flare is also dependent upon the character of the subject. Large highlight areas, open lights, and other bright highlights aggravate flare, and such subjects are therefore benefited most by cameras having reduced flare. Specific types of subject which aggravate flare are described. A lens hood can reduce flare from some of these subjects. Reduced flare has little, if any, effect on the lens speed for black-and-white photography but can effectively add speed to lenses used for color photography. Projected images from motion-picture and slide projectors in which the optical elements have been surface-treated are improved in shadow detail and have greater screen brightness. Enlargements made with enlargers having reduced flare have improved detail in the highlights from negatives of high contrast or large shadow areas. *Monthly Abstract Bulletin* 33, No. 7, July, 1947, p. 245. (Eastman Research Laboratories.)

PHOTOGRAPHIC REVERSING UNIT AND SYSTEM FOR PRODUCING REVERSED IMAGES. Stephen N. Wekeman, assignor to Sun Chemical Corporation. *United States Patent No. 2,434,378* (January 13, 1948). A photographic reversing unit adapted to be detachably associated with the lens board of a camera or the like, comprising a housing, an objective lens in said housing and comprising spaced sets of lens elements, and three right angle reflecting prisms enclosed in said housing interposed between said sets of lens elements, a first of said right angle reflecting prisms having one right angle face disposed adjacent the interior face of and in axial alignment with and normal to the axis of one of said objective lens sets, and a second of said right angle reflecting prisms having one right angle face disposed adjacent the interior face of and in axial alignment with and normal to the axis of the other of said objective lens sets, and the third of said right angle reflecting prisms being intermediate said first and second right angle reflecting prisms and having its two right angle faces disposed respectively adjacent and substantially parallel to the other of said right angle faces of said first and second reflecting prisms and having its hypotenuse face substantially parallel to a plane passing through the axes of said objective lens units, the axis of the projecting light beam as it leaves said reversing unit being parallel or substantially so with respect to the axis of the projecting light beam as it enters said reversing unit. *Official Gazette* 606, No. 2, January 13, 1948, p. 288.

Diaphragm control systems

•"LENS-O-MATIC" A COMPLETELY AUTOMATIC LENS DIAPHRAGM CONTROL. Willis N. Urie. *Process Engravers' Bulletin* 37, No. 2, September, 1947, pp. 41-44 (4 pages). The author describes his diaphragm control system which is designed to close the lens diaphragm at the proper speed for every tone; closing fast at the highlight exposure and gradually reducing speed for middletone and shadow detail. It is so designed that the lens diaphragm will close two full F stops during the exposure regardless of the reduction or enlargement. The control automatically turns on the lights, starts the exposure, turns off the lights, and returns the lens diaphragm back to the starting position.

•THE BAILEY APERTURE CONTROL AN AID TO THE REPRODUCTIVE ARTS. Harrison W. Bailey. *Photo-Engravers Bulletin* 36, No. 11, June, 1947, pp. 28-31 (4 pages). The Bailey Aperture Control was developed as an aid in securing improved negatives. It is the only control that directly connects the lens to the bellows extension. This control is helpful for film work, continuous tone and process color work. The master control permits the changing from "high" to "low" negatives in shops making both offset and engraving negatives. Instructions are given for adjustments necessary for the various types of copy. The use of the Bailey control on both line ruled glass screens and contact screens is described. Use of the Flash Lamp, which is furnished with the control, is discussed.

Crossline and related screens

•TONE VALUES OF SCREEN IMAGES (PHOTO-LITHOGRAPHY). A. Haigh and H. M. Cartwright. *Process Engravers Monthly* 54, No. 641, May, 1947, p. 134 (1 page). The relationship between dot size and tone value is discussed. The Lithographic Technical Foundation's Technical Bulletin No. 5 is recommended for information on this subject. Some of this information is discussed as follows: The dot area value is the space occupied by the dots, over unit area of flat tint, expressed as a fraction of that area. Thus if dots cover 10 per cent of the total surface of the region and white spaces between make up 90 per cent, the region has a dot area of 0.1. Integrating and photometering the light reflected from a halftone image on paper is discussed and the equation for expressing this reflection density is given. The equation used for calculating the tone density corresponding to any specified dot area is also given. It is found that the increase in tone density is slight for a given increase in dot area for light tones but it rises steeply for dot areas from 0.7 upwards. The Lithographic Technical Foundation's bulletin also shows curves for dot images of different densities, and for tone density relationship for screen negatives and positives.

•PLANNING PHOTOLITHO FOR GREATER PRODUCTION. W. G. Burgess. *British and Colonial Printer* 140, No. 970, June 6, 1947, p. 318 (1 page). Dot reduction is discussed. The controversial subject of square versus round dots is brought up and it is pointed out that, while the square dot is not ideal for every job, it will be found most satisfactory for smoothness, as well as in not presenting the difficulty in retouching that the round dot does. It is suggested that the

various methods of screen negative making should be studied, and one of these adopted and rigidly adhered to if uniform negatives are to be produced. The use of a light measuring instrument to ensure correct exposure is discussed briefly.

• IMPROVING TONE VALUES OF HIGHLIGHT HALFTONE NEGATIVES. Bruce E. Tory. *Modern Lithography* 15, No. 12, December, 1947, pp. 39, 105 (2 pages). A method for improving tone values of highlighted halftone negatives which incorporates the use of a vignetted stop, and a means for moving the screen in its plane a distance equal to the screen mesh diagonal and in a direction of 45° to the screen ruling. It is claimed that by this method a negative is produced in which the highlights are dropped out, while the light and middle tones are correct in dot size.

Half-Tone Photo-Mechanical Printing Plates. A. E. Field. *British Patent No.* 563,028 (January 21, 1943). A method of producing a halftone photographic plate includes the step of making an exposure, either successively or simultaneously, through a segmented stop comprising a series of inwardly directed projections, and through a non-circular stop which may be a square or another segmented stop. Successive exposures may be given to take account of the tones to be reproduced. Contrast control and reduction of moire are claimed to be accomplished. *Abridgement of Specifications, British Patent Office,* Group XX, Section 560,001-580,000, p. 53.

•PROCESS PRACTICE (HALF-LINE). Frank H. Smith. *Process Engravers Monthly* 54, No. 642, June, 1947, pp. 160-1 (2 pages). This article is devoted to discussion of the principles underlying half-line work when a crossline screen is used to produce lines in one direction. An aperture in the lens in the shape of a long narrow slit will produce the "single line" effect via a crossline screen. In fact the lens can be dispensed with and the same result obtained if a simple slit-shaped hole in a piece of card is used in the lens panel. An explanation is given of how and why this effect occurs.

•NOTES AND COMMENTS. W. B. Hislop. *Process Engravers Monthly* 54, No. 641, May, 1947, p. 130 (1 page). Flashing was first used as a means of overcoming the "inertia" of plate, that is its inability to record faint light below a certain value until it was set "on the move" by a stronger light. A short exposure to white paper, with a small stop, was made before exposure of the original. It was found, however, that many originals do not yield useful dots in the darkest shadows even with an inertia flash until the exposure is so prolonged that the lighter tones are relatively bleached. A flash exposure much exceeding an inertia flash puts a firm and substantial dot in the shadows without extra main exposure. An explanation is given why a flash exposure is necessary in the gelatine-silver process to ensure a useful dot in the shadows. Today use of the flashing lamp is the most satisfactory way of flashing transparencies. Instructions are given for constructing a lamp for this purpose.

•A Simple Screen-Distance Finder-Stop. Walter J. C. Hislop. *Process Engraver's Monthly* 55, No. 649, January, 1948, pp. 4 and 5 (2 pages). The writer describes a simple square stop which acts as a null-point finder for locating a predetermined screen distance if the stop is set with its sides parallel to the screen-rulings.

• PROCESS PRACTICE. Frank H. Smith. *Process Engraver's Monthly* 54, No. 648, December, 1947, pp. 326-7 (2 pages). Instructions are presented for sealing tint screens together with canada balsam. Useful advice is given on preparation of the tints, using slit apertures and by contact printing the results.

• "A NEW STAR IS RISING"—THE DUPLEX SCREEN. Meyer A. Shapiro. *Photo-Engravers Bulletin* 37, No. 4, November, 1947, pp. 232-236 (5 pages). The Duplex screen has screen rulings which are dye deposits, magenta in color. The advantages claimed with the use of this screen are improved dot formation and improvement in the reproduction scale of the half-tone. Highlight dropouts can be made by an additional exposure through a rose filter.

• THE NEW METHODS OF COPY PREPARATION AND INTRODUCTION TO THE FLUOROGRAPHIC SCREEN. Walter S. Marx, Jr. *Photo-Engravers Bulletin* 37, No. 4, November, 1947, pp. 176-185 (10 pages). The Fluorographic process and the Fluorographic screen are described. In the former, an advertising artist replaces the water in his wash solutions with a special solution which contains chemicals having the property of absorbing ultraviolet light. The halftone photographer can photograph such copy through a filter to get a highlight halftone. The Fluorographic screen has rulings of transparent orange, or of a red-orange cast which provide a filtering action that makes them opaque to some wavelengths of light and transparent to others. This screen, by use of filters, can be used in making combination line and halftone negatives.

THE FLUOROGRAPHIC PROCESS FOR HIGHLIGHTING. *Pamphlet of Printing Arts Research Laboratories,* Inc., *32 pages.* An outline of the Marx Fluorographic process, with instructions for installing equipment and use of materials.

Contact screens

•CONTACT HALF-TONE SCREENS (PHOTO-LITHOGRAPHY). C. C. Redman. *Process Engravers' Monthly* 54, No. 642, June, 1947, p. 162 (1 page). The many disadvantages of glass ruled screens prompted development of contact screens. The contact screen has a square dot pattern, of greater density at the center of the dot than at the edge, and it is photographically produced from a ruled halftone screen on to a photographic film. However, contact screens had little success until recently due to the lack of contrast control. With the introduction of colored screens by Eastman Kodak Co., however, variation of contrast is made possible by the use of colored filters. The orange contact screen is suited only for producing screen positives, and it is necessary first to produce a continuous tone negative. The magenta contact screen makes possible the production of screen negatives in the camera, from black and white continuous tone copy, and using color filters for tone control.

•PHOTO-LITHOGRAPHY (USING THE ORANGE CONTACT SCREEN). C. C. Redman. *Process Engravers Monthly* 54, No. 643, July, 1947, p. 190 (1 page). When using this type of screen, it is necessary first to produce a magenta toned negative from the original copy. This magenta toned negative may be obtained by two

means, depending on whether the original supplied is a copy to be photographed, or an existing black negative. Directions are given for both.

•THE CONTACT SCREEN POSITIVE (PHOTO-LITHOGRAPHY). C. C. Redman. *Process Engravers Monthly* 54, No. 644, August, 1947, p. 218 (1 page). A continuation of last issue's article on the use of contact screens. Directions are given for the use of the orange contact screen in preparing screen positives from ma genta negatives. The use of the magenta contact screen in the camera and contrast control with colored filters are discussed. It is not clear what the author means in writing that "Exposure is made using a stop ratio of V/48" The Eastman Kodak Company recommends an aperture to bellows extension ratio of 1:45.

Copy preparation

• OFFSET—IS TRUE TO *TYPE*. Michael Higgins. National Lithographer 54, No. 7, July, 1947, pp. 30-1, 74-5 (4 pages). Claims are made that the offset process will reproduce any type face with greater fidelity than letterpress providing the plate is made carefully. Reproduction of type faces with accuracy depends on quality of the reproduction proof, and any slight distortions are further magnified by the camera lense. "Transproofs" are sharp, opaque proofs pulled on both sides of a sheet of transparent material simultaneously, then dusted with black powder for clean edges. It is claimed that transproofs (1) can be produced with through-the-sheet accuracy of .001 inch, (2) can be made on cellulose acetate with special inks, and (3) with back and front register complete opacity of type is secured. Type faces which are not constructed to allow for distortions when printed conventionally are best for transproofs.

•Materials and Techniques of Layout. Charles J. Felten. *Modern Lithography* 16, No. 2, February, 1948, pp. 38-40, 101 (4 pages). The various materials needed by a layout man are listed. General suggestions for layout procedures are discussed in a manner easily understood and followed by the beginner.

• MORE BUSINESS WITH KEMART. J. S. Mertle. *Photo-Engraver's Bulletin* 37, No. 6, January, 1948, pp. 18-27 (10 pages). The author describes the applications and advantages in the use of the "Kemart" process. This process employs fluorescence artist boards, and solutions which neutralize or deactivate the fluorescence.

Retouching and dot etching

• DOT ETCHING. J. S. Mertle. *Modern Lithographer and Offset Printer* 43, No. 7, July, 1947, pp. 144, 146 (2 pages). The two chemical reducers that are relied on almost exclusively are iodo-cyanide and Farmer's reducer. The respective merits of these two reducers are discussed. The chief objection to the use of cyanide is its poisonous properties. However, the iodo-cyanide exerts a smoother action on the edges of the halftone dot and is much more stable than the Farmer's reducer. A series of experiments made to compare the action of the two reducers and the results of these experiments are described.

Tone and color correction

THE CONTROL OF TONE REPRODUCTION IN LITHOGRAPHY. Michael H. Bruno and George W. Jorgensen. *Lithographic Technical Foundation Publication No. 701*, April, 1948, 32 pages, $1.00. The new LFT Sensitivity Guide for the control of tone reproduction in platemaking is described. It consists of a calibrated, continuous tone step wedge which is exposed with the subject on either albumin or deep etch plates. The number of the last printing step which appears on the developed plate is an accurate measure of the sensitivity of the coating, and consequently, of its tone reproduction characteristics. Considerable progress has been made in the direction of controlling tone reproductions in printing on the press by the development of metal surface treatments, such as Cronak for zinc and Brunak for aluminum, and the introduction of superior desensitizing agents such as cellulose gum. The metal treatments and cellulose gum improve the wettability of the plate by water so that many of the troubles affecting tone reproduction on the press, such as image spreading, sharpening, blinding, scumming, low ink density due to ink emulsification, etc., are eliminated or minimized. Reasonably acurate control of tone values in platemaking and printing are in sight. The problem of precise practical control of tone reproduction in photography remains to be solved.

* THE DENSITOMETER. *Modern Lithography* 15, No. 9, September, 1947, pp. 32-35 (4 pages). Excerpts from Technical Bulletin No. 4 "Optical Density" of the Lithographic Technical Foundation. A general discussion of density and the use of densitometers for reading densities on continuous tone, halftone, transparent, or opaque images.

The Densitometer. Part II.** ***Modern Lithography **15, No. 10, October, 1947, pp. 83, 85, 87, 89 (4 pages). Excerpts from Technical Bulletin No. 4, "Optical Density" by the Lithographic Technical Foundation.**

DENSITOMETER OF UNUSUALLY HIGH SENSITIVITY. M. H. Sweet. *Ind. Radiography* 6: 47-8, Summer, 1947. A densitometer using a Type 931 electron-multiplier tube has been designed which will read black-and-white densities up to 6.0. In appearance and manner of use, it is similar to the conventional Ansco-Sweet densitometer. *Monthly Abstract Bulletin* 34, No. 1 January, 1948, p. 16.

CONSIDERATIONS IN THE DESIGN OF A RADIANT ENERGY INTEGRATING INSTRUMENT SPECIFICALLY ADAPTABLE TO THE VARIOUS PROCESSES USED IN THE GRAPHIC ARTS INDUSTRY. Clarence S. Ost.** ***Photo-Engravers Bulletin **36, No. 11, June, 1947, pp. 21-28 (8 pages). Experiments conducted in an effort to develop a light integrating instrument which would fill all the needs of the graphic arts industry for securing precision exposures are described. Information secured from these experiments was utilized in designing the Luxometer. A description is given of its design and functions. The structural features which make it unique from other light integrating meters are discussed.**

Density Determination of Color Film. "British Journal of Photography" 93: 366-7, October 11, 1946. (See also R. H. Bingham: "Journal of the Society of Motion Picture Eng. 43: 368, May, 1946). The Ansco Color Densitometer for the measurement of color densities through red, green, and blue filters with narrow transmission bands is

discussed. These bands are converted into equivalent densities by calculation or by means of a graph. The method of calculation is explained. The speed and contrast for the individual layers, and hence, the color balance, can be determined from the equivalent densities. Means for determining the effect of change in contrast on color-rendering are discussed. Results are given of Bingham's calculations of the reproduction of five Munsell color samples at a gamma of 1.0 and at a gamma of 1.5, by means of cyan, magenta, and yellow dyes of specified spectral - density characteristics. At both gamma values, the saturation errors are greater than the hue errors. At the higher contrast, the saturation errors are reduced. At a gamma of 1.5, purple is the least saturated color and also has the greatest over-all color error. At a gamma of 1.0, the greatest over-all color error is in the red, owing largely to poor saturation. "Monthly Abstract Bulletin of Kodak Research Laboratories" 33, No. 3, March, 1947, p. 100.

Color News—Density Determinations of Color Film.** ***British Journal of Photography **93, 366-67, October 11, 1946. The Ansco densitometer previously mentioned is discussed and the theory of color-density measurement upon which it is based is explained in detail. Formulas and a chromaticity diagram are included, and it is shown how over-all contrast affects color rendition and changes of hue.** ***Monthly Abstract Bulletin*** **34, No. 1, January, 1948, p. 24.**

COLORIMETER. *Chemical and Engineering News* 26, No. 18, May 3, 1948, pp. 1306-7 (2 pages). A photoelectric tristimulus colorimeter is offered by the Henry A. Gardner Laboratory, Inc. Photocell windows and measuring circuits have been selected so that the three values of color are read directly from 10-turn potentiometer rheostats.

* COLOR CORRECTION IN COLOR PRINTING. Arthur C. Hardy and F. L. Wurzburg, Jr., *Journal of the Optical Society of America* 38, No. 4, April, 1948, pp. 300-7 (8 pages). In a three-color print, the color of any area that is large in comparison with the size of the dots of the structured image can be regarded as an additive mixture of eight colors: the unprinted paper stock; the cyan, magenta, and yellow of the individual ink dots; the red, green, and blue that result when ink dots overlap in pairs; and the black that results when all three ink dots overlap. Since the extent of overlapping is determined by the sizes of the dots, the color of the additive mixture can be expressed by three equations. The straightforward attack on the problem of color reproduction is to solve these fundamental equations for the required dot sizes on the assumption that, in every area, the tristimulus values of the reproduction should be equal to those of the original. This has not been accomplished hitherto, because it involves solving three simultaneous equations of third degree, each containing eight terms. However, a relatively simple electronic equation-solving network has been constructed which solves these equations with ample precision in 0.001 second. By using this network in connection with a scanning machine of the type described in the preceding paper, full color correction is achieved. A corresponding set of equations can be written for the additive mixture produced in four-color printing, wherein the fourth color is black. Since the three equations now contain four unknowns, an additional condition must be imposed.

From the standpoint of the printing requirements, it is desirable that at least one of the color dots be absent, or of some predetermined minimal size, in every region of the reproduction. An extension of the principles embodied in the electronic network mentioned above imposes this condition and yields a continuous solution to the three fourth-degree equations.

• SEPARATION POSITIVES ON KODAK RESISTO PAPER. *Bulletin of the Graphic Arts*, Eastman Kodak Co., No. 10, 1947, p. 9 (1 page). The use of a special water-resistant, dimensionally stable photographic paper for preparing continuous-tone color-separation positives for the retoucher is suggested. The positives are prepared by contact printing or enlarging the continuous-tone separation negatives. The corrected positives furnish reflection copy and, as such, can be mounted on the ordinary copyboard. The method is said to offer flexibility and widens the scope of the layout artist.

Color—general

•THE I.C.I. STANDARD OBSERVER AND CO-ORDINATE SYSTEM AND THEIR USE IN STUDIES OF THE COLOR OF PAPER. J. A. Van den Akker. *Paper Trade Journal* 125, No. 2, July 10, 1947, pp. 49-54 (6 pages). Spectrophotometric data in the form of spectral reflectance curves ("color curves") are most useful in connection with mill control of color and in fundamental studies of color. However, it is sometimes necessary or desirable to obtain accurate numerical expression of the color, or of a color difference, corresponding to a color curve or pair of curves. An objective and accurate psychophysical bridge between purely physical data and color sensation is afforded by the I.C.I. standard observer and co-ordinate system. The I.C.I. system is described, with particular reference to reflecting bodies (such as paper) and transparent bodies. Some applications of the I.C.I. system to problems in the paper industry are discussed.

PRINCIPLES OF COLOR AND COLOR MIXING. . H. Bustanoby. Book published by McGraw-Hill Book Company, 330 W. 42nd Street, New York 18. 1947. 131 pages. $4.50. A guide for anyone concerned with the application of color. It provides a unique yet simple system for identifying, with speed and accuracy, a wide variety of today's standard and popular hues, tints, tones, and shades—including 242 formulas for mixing them. Clear descriptions of each are given and 96 are shown in actual color. Other scientific and usable color facts deal with the aesthetic and psychological values of color, legibility of colors at a distance, the influence of color on our daily living, etc. Authoritative definitions of color terms are included.

• COLOR ORGANIZATION BY THE OSTWALD SYSTEM. Walter C. Granville. *American Printer* 125, No. 1, July, 1947, pp. 23-25, 27. (4 pages). In the Ostwald system of color order, the basis of the order is an equilateral triangle in which white, black and a full color are located at the points. A series of neutral grays with white at the top and black at the bottom is shown in the longest vertical series. Color chips in each triangle show 28 variations obtainable in a single hue by different combinations of the full color with white and black. The Ostwald triangle shows three series of colors: the light clear series including the full

color and white, commonly called tints; the dark clear series including the full color and black, called shades, and the shadow series which illustrates the color change a surface undergoes when thrown into shadow. An Ostwald color solid consists of 24 hue triangles located in vertical positions about a vertical gray scale, with the complementary hues opposite one another. Six illustrations of an Ostwald color solid are given. Use of the Ostwald color order for developing color harmony, and the meaning of the terms white, black, and full color and how they are modified by printing are discussed.

• **SOME THEORETICAL, PRACTICAL AND PSYCHOLOGICAL ASPECTS OF COLOR.** Martin J. Monahan. *Paint, Oil and Chemical Review* 111, No. 7, April 1, 1948, pp. 15-16, 32-4, (5 pages). Both the light and pigment primary and complementary colors are discussed and it is shown that the mixing of lights and the mixing of pigments are closely related, one being an additive process starting from darkness and adding three lights until white is produced. The other process is subtractive, starting from white light, subtracting the same three lights until black is produced. The eye is unable to judge or appraise any color except by making comparisons or by contrast. Among the common expressions used in connection with color defined in this article are: chroma, intensity, or purity; hue; and value. The Munsell Color Notation System, designed to specify a given color from a standpoint of chroma, hue and value is explained. The psychology of color and the use of colors in decorating are among the other topics covered in this article.

Increased Color Saturation of Color Photographs. E. Schindler. *Gebrauchsfot* 50: 49-52, No. 4/5, April-May, 1948. The author discusses some reasons for the faulty judgment of color photographs. The belief that a photograph is too highly colored may be attributed to the reduction of a natural scene to small dimensions and the consequent increase in apparent saturation, resulting from the close proximity of the differently colored areas. Also, the lack of stereoscopic quality in photographs taken with a single lens exaggerates the color. Colors which are far apart in the spectrum, but which are brought close together in a photograph tend to produce a scene with more saturated color. The author believes that a better understanding of the psychological basis of color vision and color relationships will result in the ability to judge a photograph with greater intelligence and accuracy. *Monthly Abstract Bulletin* 34, No. 1, January, 1948, p. 25.

• SIMPLIFYING THE USE OF COLOR IN THE PRESSROOM. Russell J. Hogan. *American Printer* 125, No. 1, July, 1947, pp. 46-50 (5 pages). Knowledge of color mixing and color matching is very important in obtaining high quality color printing. Seeing colors correctly is a requisite for color matching and it is suggested that a color test be given all those employed in color matching and color printing. Knowledge of the basic principles of mixing of colors is necessary to become an efficient color matcher. It is pointed out that it is impractical to mention a color and give a definite formula for matching since one manufacturer's ink is not the same as another's. Primary, secondary, tertiary colors and neutrals are discussed. Basic equipment and materials necessary for efficient color matching are described in detail. Directions are given for tests which will

be of assistance in obtaining perfect matches.

Color photography—general

•COLOR REPRODUCTION. H. M. Cartwright. *British and Colonial Printer* 140, No. 970, June 6, 1947, p. 316 (1 page). Exact reproduction of a painting with tricolor inks is hardly ever possible. It is therefore necessary either to make additional printings with specially selected inks which adds greatly to the cost, or else an interpretation of the original must be made. Ideas advanced as possible solutions to the problem are that the artist use only three pigments similar to those used for printing; or that fluorescent pigments be used, accompanied by a special photographic technique. The author mentions that a mixture of media should be avoided as far as possible, and that matt surfaces given by poster and water colors is more suitable for reproduction than the rough, glossy surface of an oil painting. Also discussed are: changes in color rendering due to color deficiencies of the printing inks; color filters and their use in making color separation negatives; color correction, both by masking and hand retouching; and color photographs.

• COLOR PHOTOGRAPHY. Joseph S. Friedman. *American Photography* 41, No. 6, June, 1947, pp. 47-8 (2-pages). The struggle between the theories of physical reproduction of color and psychological reproduction for acceptance is discussed briefly. With acceptance of the tri-chromatic or psychological theory it became necessary to develop a method of obtaining the three separations. Methods for this purpose described in this article include: the method of making three photographs, one after the other, using the light of a single primary for each; the method of coupling three cameras together; the system of placing three supplementary lenses, each containing within its system its own particular filter, imemdiately behind a large receiving lens, so positioned that each of the supplementary lenses utilizes a separate part of the cross-sectional area of the receiving lens and the one-shot camera.

• DEVELOPMENTS IN COLOUR REPRODUCTION. H. M. Cartwright. *Paper and Print* 20, No. 4, Winter, 1947, pp. 298, 301-2, 304 (4 pages). Developments in processes based on tri-chromatic photography are discussed. Tricolor principles and the limitations in application in lithography, letterpress, photogravure, collotype, and silk-screen are noted.

BALANCED SEPARATION NEGATIVES FOR COLOR PRINTING. II. FROM KODACHROME ORIGINALS. C. P. Costin. *Australasian Photo Review* 54:137-41, March, 1947. (For Part I, see *Ibid.*, 53:582, December, 1946; *Monthly Abstract Bulletin* 33:163, May, 1947.) Means are discussed for measuring densities to assist in obtaining balanced separation negatives from Kodachrome originals. A laboratory densitometer, such as the Eastman, or a Kodak Densiguide is suggested. A method is described by which an exposure meter and a light source are used to measure the transmissions of the steps on the wedge from which the densities are calculated. This method gives specular densities which must not be compared with diffuse densities derived from a densitometer. A simple formula for ascertaining the effective gamma of the negative consists in dividing the desired density range by the pre-

determined range of the Kodachrome original. Projection methods for copying the Kodachrome original are discussed and a holder containing the Kodachrome original and a step wedge, that fits the negative holder of the enlarger, is described. To prevent light leaks from the enlarger, a black satin bag is used over the entire apparatus and fastened with a drawstring just behind the lens. Sharply cutting filters F, N, and L are required in place of the usual A, B, and C for the separations. Panatomic-X Plates are suggested for the negatives. Trial exposures, developed for different times in DK-50 solution, diluted 1:1, ollowed by densitometer readings, are suggested for determining time-gamma curves. Filter factors should be adjusted to compensate for individual light sources. An example of exposure and development times is given as a guide, but is said not to be applicable for all enlargers. A stronger developer (2:1 dilution) was used for the blue-filter negative to avoid excessive development time. A temperature of 65° F. instead of 70° F. was used for all three negatives to obtain a low gamma but to allow sufficient duration of development for accurate timing. *Monthly Abstract Bulletin* 33, No. 10, October, 1947, pp. 403-4 (Eastman Kodak Company).

***Reproduction of Line Originals in Colour.** C. C. Redman. *Process Engravers Monthly* 54, No. 645, September, 1947, p. 242 (1 page). Various methods of producing color plates from line originals are discussed. Four types of originals are considered, together with the parts played by both artist and photographer.

***Reproduction of Line Originals in Colour.** C. C. Redman. *Process Engravers Monthly* 54, No. 646, October, 1947, (1 page). Some of the fundamentals of color reproduction are discussed; the nature of light and color, and the use of color filters in the preparation of color separations.

* REPRODUCTION OF LINE ORIGINALS IN COLOUR. C. C. Redman. *Process Engravers Monthly* 54, No. 647, November, 1947, pp. 300-1 (2 pages). The selection of the color filter to be used will depend on the subject, taking into consideration which colors are to be eliminated (rendered opaque on the negative) and which to remain as clear glass for subsequent printing. To eliminate a color, the filter should be the same color. One successful method of eliminating unwanted colors is by the use of masks and "printing out." The process is in two stages: first, the resensitizing of the original camera negative; and secondly, the printing out of the unwanted colors by exposing to light through a mask placed in exact register. Formulas and the processing steps are given.

* PHOTO-LITHOGRAPHY — REPRODUCTION OF LINE ORIGINALS IN COLOUR. C. C. Redman. *Process Engraver's Monthly* 54, No. 648, December, 1947, p. 329 (1 page). Application of masking techniques to the original or to the camera negative in the reproduction of line originals in color are discussed. The masking technique is primarily considered for elimination of large areas where a considerable savings in "painting-out" time is achieved.

COLOR SEPARATION WITH FLUORESCENT MATERIALS. Joseph L. Switzer and Robert C. Switzer. *United States Patent No. 2,434,019* (January 6, 1948). The method of

making reproductions of original compositions comprising the steps of preparing an original in a luminescent medium, lighting the original with substantially only fluorescigenous radiations, photographing the original only while it is luminous through a color filter selected to transmit a color of the luminous original to produce a color printer, producing a printing plate from the color printer, and printing a reproduction from said printing plate. *Official Gazette* 606, No. 1, January 6, 1948, p. 117.

• HERSCHEL EFFECT AND SOLARIZATION APPLIED TO MAP REPRODUCTION. *Army Map Service Bulletin No. 26,* February, 1948 (19 pages). Dropping the "black" photographically in map reproduction by the Her-Sol Process is described in this article. The idea was conceived in Germany toward the end of World War II. Army Map Service personnel were assigned the task of investigating and assaying its value. The Her-Sol Process, within certain limits, permits production of separation negatives directly from the original by contact, in which every color but the one desired, including black, is eliminated. The photographic principles involved are the Herschel effect; the fading of the latent image on a color-blind or orthochromatic emulsion by exposure to red light, and solarization: the reversal of images by great overexposures . . . especially on desensitized emulsions. Details of the process are described.

• COLOR FILTERS AND EXPOSURE RATIOS. J. S. Mertle. *Modern Lithographer and Offset Printer* 43, No. 8, August, 1947, pp. 166, 168 (2 pages). The respective advantages of glass and film filters are discussed. Glass filters are more permanent; however, if film filters are properly cared for and stored to prevent scratches and fading they will last for many months. Film filters can be mounted on a metal or cardboard holder the correct size and shape to fit the slit in the lens where square stops are inserted. Another advantage of film filters is that there is no need to use a dummy filter for focussing because the film does not affect the focussing. The correct use of special sharp-cut filters is discussed. The importance of exposure ratios in color work is discussed. Variable factors affecting these ratios include the type of illumination. Definite exposures cannot be set for daylight, gas-filled lamps, or flame arcs. The amount of blue compared with amount of red in daylight will vary. Gas-filled lamps have a certain temperature when new and become warmer after use. Also a slight deposit on the bulb induces a further possibility of change in color composition. In the case of flame arcs the user has no control over the composition of the carbon core which in turn controls the color of light.

• THE DILKES THREE-IN-ONE AUTOMATIC COPYBOARD AND TRANSPARENCY CHART. *Photo-Engravers Bulletin* 37, No. 5, December, 1947, pp. 40-1 (2 pages). This chart serves as a focusing guide, gray scale, and automatically indicates the color each separation negative represents (colored letters on the chart drop out in the negative to indicate the filter).

Color transparencies

TRANSPARENCY VIEWER NEW AID TO EXACT COLOR WORK. *Printing* 71, No. 5, May 1947, p. 69 (1 page). The Chromocritic is a new

type of transparency viewer. It has adjustable light sources which control the color tones. Meter readings of the two adjustable light sources which have given the buyer just the color tones he wants, are marked on the edge of the transparency. When the color plates are being corrected, the transparency is viewed through a similar viewer with the two color source meter readings set as indicated. Masks are available for each size transparency, maximum 12" x 12". This viewer is distributed by the MacBeth Arc Lamp Co.

Masking methods

•THE MASKING METHOD OF COLOR REPRODUCTION, PART II. *Bulletin of the Graphic Arts* 9, 1947, pp. 4-7 (4 pages). The use of highlight and shadow masks to insure good contrast and detail in the highlights and shadows of a reproduction is discussed. Detailed instructions are given for the use of a highlight mask on transparencies, the use of a highlight mask on color separation negatives, and the use of a shadow mask on color separation negatives. The highlight and shadow masks are not used in place of the red- and green-filter (principal) masks. The principal masks are still needed for color correction whether or not highlight and shadow masks are used. The sensitometric curves involved in the use of the highlight and shadow masks are briefly explained.

• THE MASKING METHOD OF COLOR REPRODUCTION, PART III. *Bulletin of the Graphic Arts*, Eastman Kodak Company, No. 10, 1947, pp. 3-4, 5 (3 pages). A new masking method is introduced which makes use of a magenta-dyed negative mask to achieve a high degree of color correction. While primarily for use with reflection copy, the method can be adapted for use with transparencies. Among the advantages claimed are: it is simpler and quicker; gives a better black printer; it avoids excessively dense masked negatives; and it permits continuous-tone positives to be made by contact printing. No special equipment is needed. If two magenta masks are used, one for the "red" printer, the other for the "yellow" printer, the color correction should be excellent provided the modelling is to be carried in the three color plates and the black plate is merely for increasing be corrected properly, and the yellow the maximum density. If a single, red-filter mask is used, the red printer will will be taken out of the blues. The single mask will not, however, take the excess yellow out of the magentas and purples; nor will it strengthen the yellow in the reprodûction of the greens. The magenta mask is prepared with the Kodak Magenta Developer.

• THE KODAK MAGENTA MASKING METHOD. Ira J. Hoffman. *Photo-Engravers Bulletin* 37, No. 4, November, 1947, pp. 162-168. The author describes the magenta masking procedure for color correction. The magenta mask is optically clear; therefore does not affect the sharpness of detail in the optical image transmitted through it. New Materials and new formulas for processing are also discussed.

•MASKING FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 54, No. 8, August, 1947, pp. 31, 78 (2 pages). This first in a series of articles on masking deals with some general masking premises. A color correcting mask should accomplish three goals: first, and of major importance, the color saturation must be adjusted

in relation to the black areas of the sketch; second, the color saturation must be balanced in its mixtures; and third, the complementary or unwanted colors must be lightened. A method is suggested for preparation of a color chart, and its use with a densitometer to obtain statistics useful in determining the effect and value of varying strengths and combinations of masks without the expense or time required to make and try them. Instructions are given for correcting, by masking, a number of common color errors.

• MASKING FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 54, No. 9, September, 1947, pp. 32-3 (2 pages). A continuation of a series of articles on masking for color correction. In this article the author discusses a simple masking procedure for beginners. Even though some correction is still necessary with this method the resulting reproduction will be more true.

• MASKING FOR COLOR CORRECTION. PART III. Frank Preucil. *National Lithographer* 54, No. 10, October, 1947, pp. 32-3, 63 (3 pages). In this, the third article in the series, the author considers the actual making of positive masks and their control through densitometric measurements. The discussion includes the necessity for standardization of developing controls and means of finding the density range required for a typical mask.

• MASKING FOR COLOR CORRECTION. PART IV. Frank Preucil. *National Lithographer* 54, No. 11, November, 1947, pp. 34-5, 92 (3 pages). In this fourth article of a series on masking, the author discusses some of the characteristics of color separation negatives. Consideration is given to the usable density range of the negative material, exposure, and the gamma to which it is developed.

• MASKING FOR COLOR CORRECTION. Frank Preucil. *National Lithographer* 54, No. 12, December, 1947, pp. 34-5 (2 pages). In this fifth article in a series on masking, the author discusses photographic methods of improving blue and black plates.

• MASKING. Article 6. Frank Preucil. *National Lithographer* 55, No. 1, January, 1948, pp. 32-3, 60 (3 pages). An added step of using preliminary masks to withhold densities in certain areas while exposing the actual masks can give more perfect rendition of all colors, and much more effective masks for the black plate can be made with the help of these preliminary masks. Methods of computing the color correction from masks are shown.

•**Masking.** Frank Preucil. *National Lithographer* 55, No. 2, February, 1948, pp. 32, 33, 105-6 (4 pages). In this article, Mr. Preucil elaborates on the use of masks for fine color reproduction, introducing the type 3 mask. This mask should adjust the color saturation in relation to the black areas, the color saturation should be equalized in mixtures, and the complementary or unwanted colors should be lightened.

• MASKING FOR COLOR CORRECTION (ARTICLE 8). Frank Preucil. *National Lithographer* 55, No. 4, April, 1948, pp. 32, 33, 72, 75 (4 pages). This article concludes the basic study of positive masks and reviews the effects of the different type masks. The consideration of negative masks is started.

• MASKING IN PHOTOGRAPHY. Martin Leeden. *Modern Lithographer and Offset Printer* 43, No. 4, April, 1947, pp. 76, 82 (2 pages). The effect of a mask is to correct tone or color values without any serious loss in photographic quality if used correctly. The area mask, the unsharp mask, and the high-light mask are described, and the use of each discussed. Instructions are given for masking Ektachrome transparencies. It is pointed out that masking does not provide complete color correction and the need for a considerable amount of hand retouching still remains.

• MASKING FOR COLOR WITH REFLECTED COPY. F. Wheeler Callender. *Modern Lithography* 16, No. 3, March, 1948, pp. 40-2, 51-2 (5 pages). Masking procedures for use on reflecting copy are discussed.

Photographic Masking. John A. C. Yule, assignor to Eastman Kodak Company. "U. S. Patent So. 2,420,636" (May 13, 1947). The method of making a photo print of magnification M and small circle of confusion C from a sharp colored record which comprises making a mask by punctual printing from the record onto sensitive material and by processing the material to a negative relative to the record and to a contrast less than that of the record, unsharply masking the record by said mask, the unsharpness being between $\frac{C}{3M}$ and $\frac{25C}{3M}$ whereby it is sufficient to increase apparent detail contrast relative to over all contrast of the record but not sufficient to be apparent under normal conditions of viewing the combination of the record and mask or a print therefrom at a distance of about 5000C and printing sharply from the record as unsharply masked. "Official Gazette" 598, No. 2, May 13, 1947, p. 311.

•NEW MASKING METHOD AND FINE LINE DEVELOPER ANNOUNCED BY KODAK. *American Photo-Engraver* 39, No. 11, November, 1947, pp. 1125-6 (2 pages). The Kodak Magenta Masking Method for color correction when making color separations involves the use of a magenta dye image mask in the camera, not in contact with the separation negative material, during the entire exposure. Preparation of the magenta mask is described and advantages of this process are cited. Kodalith Fine Line Developer enables the reproduction of extremely fine line copy with greater accuracy and completeness than was formerly possible. Its use differs from the conventional method in that agitation is used for only approximately 10 to 15 seconds.

Photoelectric tone control

• A PHOTOELECTRIC METHOD FOR PREPARING PRINTING PLATES. Arthur C. Hardy and F. L. Wurzburg, Jr. *Journal of the Optical Society of America* 38, No. 4, April, 1948, pp. 295-300 (6 pages). Whenever the subject being reproduced has a regular pattern, the conventional type of halftone screen, because of its regular structure, may produce an objectionable beat pattern, called moire. In multicolor printing, the regular patterns of the several structured images produce complex beat patterns whose effects are minimized, but not eliminated, through proper choice of screen angles. This paper describes a procedure in which a continuous-tone image is scanned; and the resulting photo-tube signal is used to actuate a light value in such a manner as to produce a structured image containing dots that are, in effect, distrib-

uted at random. It is shown that this procedure avoids both the distortion in tone reproduction and the moire patterns associated with the conventional use of halftone screens.

Photographic typesetting

• THE FOTOSETTER. A. E. Giegengack. *National Lithographer* 54, No. 10, October, 1947, p. 41 (1 page). A description is given of the new photo-typesetting machine designed by the Intertype Corporation, the Fotosetter. The right hand side of this machine is essentially like standard hot metal slug setting equipment. It has magazines and uses mats, but instead of the punched character on an edge for casting they have a transparent letter on the flat side through which light is projected. The machine is capable of any automatic leading and spacing between lines. After whole line is set it passes to camera side of Fotosetter and each mat is photographed individually on film. A right-reading print on paper can be obtained from machine. The film comes from the Fotosetter ready for development either in negative or positive form. Corrections and make-up are done by stripping.

***Intertype's Engineer Describes Operation of "Fotosetter." H. R. Freund.** *American Printer* **125, No. 4, October, 1947, p. 27 (1 page). H. R. Freund, chief engineer, Intertype Corporation, makes the first report on the functions of the company's photographic typesetting machine to PIA delegates. See also** *United States Patent 2,426,146* **(August 19, 1947).**

• FOTOSETTER—FURTHER DETAILS RELEASED. Herman R. Freund. ***Printing Equipment Engineer*** **75, No. 6, March, 1948, pp. 33-4 (2 pages). Details of the operation and structural features of the Fotosetter are described. The Fotosetter is built on the familiar principle of the present slug-casting machine, but in place of the casting mechanism, camera equipment is used. After the line is delivered to the justifying mechanism, the camera begins to function and the assembled line is projected and photographed letter by letter onto the sensitized paper or film. The Fotosetter produces film positives, film negatives, and paper positives. Thus any printing plate required either for photo-engraving, offset-lithography, or gravure can be made by direct emulsion contact from the film.**

• HOW THE FOTOSETTER FUNCTIONS. Sam A. Cousley and Horace Annis. ***Printing*** **72, No. 3, March, 1948, pp. 46-7 (2 pages). Details are given on the Fotosetter including how its special camera operates and how corrections are made. Among other features claimed for it are: since its keyboard is essentially the same as a standard Intertype, any "hot metal" operator can operate it; it will operate at a speed far in excess of the manual speed of the fastest operator; from one set of mats, by use of a set of eight lenses, eight different type sizes can be set; from the film negative an Ozalid print can be secured for proofreading; and the Fotosetter can be operated by a teletypesetter.**

• FREUND GIVES DESCRIPTION OF NEW INTERTYPE FOTOSETTER. Glenn C. Compton. *Inland Printer* 120, No. 6, March, 1948, pp. 33-36 (4 pages). The Fotosetter is built on the principle of present slug-casting machine except that the camera assembly replaces the metal pot. A keyboard containing 114 keys provides three alphabets as well as a complete

set of figures and points. The Intertype Fotomat is entirely new and revolutionary in character. The master character, in the form of a photographic negative image, is imbedded in a circular aperture in the side of the matrix, secured in position and fully protected from injury. Because the principle of circulating mats is used and because each mat thickness is equal to the width of the character it bears, each letter is perfectly spaced and aligned during process of photographing on sensitized film or paper. The camera and its operations are described in detail.

• PHOTO-TYPESETTING HAS ARRIVED. *Modern Lithography* 15, No. 5, May, 1947, pp. 50, 127, 129 (3 pages). The following photo-typesetting machines are described: the Intertype; the Phototextype, built by Huebner Laboratories; three European machines, namely, the Crotype, the Uhertype, and the Westover Photo-Typograph; and the machine patented by Alex G. Highton, U. S. Patent 2,351,126. The problem of corrections has been one of the most difficult in successful commercial photo-typesetting; however, both Huebner and Intertype claim to have a successful correction method. All of these machines are in the development or experimental stage, and none are on the market yet.

• PROCESS PRACTICE: PHOTO-COMPOSING. F. H. Smith. *Process Engraver's Monthly* 53; November, 1946, pp. 300-01 (2 pages). The outstanding virtue of the relief letterpress principle is its extreme flexibility. Text matter for photolithography and photogravure is produced by setting letterpress metal type either by hand or machinery and pulling a proof in black on white or white on black. The principle of photocomposing is the "setting" of the text matter, not in metallic type slugs or lines, but by optical projection directly in the form of photographic negatives or positives, ready for printing on lithographic plates or gravure cylinders. This would seem at first sight to be an obvious advantage, but the extreme flexibility of typesetting corrections and alterations, and the high degree of efficiency attained, causes a speculation as to whether photocomposing could possibly be made quite so adaptable and convenient. *Monthly Abstract Bulletin* 33, No. 11, November, 1947, p. 439.

PHOTOGRAPHIC TYPE-COMPOSING MACHINES. R. C. Elliott, M. R. Dewhurst, J. B. S. Booth, and Monotype Corporation Ltd. *British Patent No. 563,331* (April 16, 1943). This machine projects single characters or symbols through a lens on to a light sensitive surface to form on the surface composed and justified lines. This photographic impression is then transferred by known means to the plate or cylinder of a lithographic or other press. *Abridgement of Specifications*, British Patent Office, Group XX, Section 560,001-580,000, pp. 62-4 (3 pages).

Photographic Justifying Apparatus. Clarence C. Smith, assignor to International Business Machines Corporation. "U. S. Patent No. 2,421,656" (June 3, 1947). Apparatus for photographically reproducing typewritten copy line-by-line in justified form and comprising a copyholder for moving each line of the copy into a photographing position; a camera for photographing the lines of copy in succession on a light sensitive medium; lens means movable along a path extending transversely of the optical axis and between the line of copy in

photographing position and said camera, and said lens means comprising a plurality of cylindrical lenses mounted in side-by-side relation and being formed, respectively, with curved surfaces having different degrees of curvature and being arranged so that as each lens is moved into a position between the line of copy in photographing position and the camera lens, the curved surface of such lens extends in the same general direction as the said line of copy; and means for selectively positioning said cylindrical lenses along said path so that the lines may be photographed on said medium at a predetermined justified length. "Official Gazette" 599, No. 1, June 3, 1947, p. 118.

Typewriter photographic copy

• TYPESETTING SUBSTITUTES. *National Lithographer* 55, No. 3, March, 1948, pp. 31, 89 (2 pages). The methods and machines now in use as substitutes for type characters set in metal type can be classified into three sections: typing machines with interchangeable faces, ordinary and improved typewriters, and the various ways now devised to take a line of characters and distort them photographically or by other means. Among the typesetting substitutes discussed are: the Coxhead Vari-Typer, the Royal Photo Offset Typewriter, the Edison Margin Justifier, and the "Fotosetter."

II. PLANOGRAPHIC PRINTING PROCESSES

General

• BACK TO FUNDAMENTALS. National Lithographer 54, No. 5, May, 1947, pp. 44, 92, 94 (3 pages). Illustrations are given of the different types of grains and its is stated that a fine and deep grain should meet all requirements. Instructions are given for cleaning ink rollers of the chemicals neither gasoline nor kerosene removes. Halftone negative making is discussed, and an explanation given why this article favors the one-stop method over the two- or three-stops.

• BACK TO FUNDAMENTALS. *National Lithographer* 54, No. 9, September, 1947, p. 38 (1 page). Good offset printing depends upon the ability of ink to transfer properly from blanket to paper. Ink alone cannot accomplish a perfect transfer. Correct pressure, paper surfaces, and the condition of the rubber blanket surface are factors affecting this transfer. It is pointed out that the photographer and those working with him, usually a stripper or an opaquer, must cooperate to secure good results. Desensitization of lacquer on a deep-etch plate may be caused either by using a developing ink so thick that it fails to dry properly and thus comes off with the coating when it is scrubbed off the plate, or by using a developing ink so thin that it fails to protect the work area from the effects of the desensitizing etch.

• COATING AND EXPOSING PLATES. Charles F. King. *Inland Printer* 119, No. 5, August, 1947, pp. 85-87 (3 pages). The lack of uniformity of deep-etch and albumin coatings produced on lithographic plates by whirlers is discussed. The thickness of coating depends on the amount of water on the plate, the whirler speed, the grain on the plate, and density of the coating solution. Coordination of coat-

ing thickness and exposure time is emphasized. The use of a light integrating meter is recommended. The importance of the proper vacuum during exposing is discussed and methods are proposed for preventing denting of plates or breaking of glass negatives during exposure.

***Experimenting with Methods.** Charles F. King. *Inland Printer* 120, No. 1, October, 1947, pp. 71-3 (3 pages). Many shops try new methods and materials in platemaking which are claimed to make plates run longer or produce better quality printing when they cannot get normal runs from plates made by standard methods and with the regular materials. The author claims that this is due to lack of skill. One of the principal sources of trouble is improper gumming of plates. Directions are given which stress the importance of clearing the ink image to enable easy washing out. Controls in albumin platemaking are also discussed.

* UNIFORM SUPPLIES AND TECHNIQUES. Charles F. King. *Inland Printer* 119, No. 6, September, 1947, pp. 49-52 (3 pages). A discussion of the need for standardization within the lithographic industry and also for specifications covering the materials used by it. This can be done only when the actual purpose of each material and operation is fully understood. The characteristic of developing inks, techniques in development of albumin plates, and desensitizing solutions are also discussed.

***Solvents Used. in Lithography.** Charles F. King. *Inland Printer* 120, No. 5, February, 1948, pp. 67-70 (4 pages). Solvents are classified into the following groups: petroleum solvents, which include Stoddard Solvent, VM & P naphtha, turpentine, and Lithotine; coal-tar solvents, among which are Benzol, Toluol and Zylol; and solvents from alcohol such as methyl, Ethyl (denatured), iso propyl. The merits, hazards, and use of these various solvents are discussed. Health and fire hazards can be minimized by the careful selection of solvents for use in the lithographic industry.

Methods of Drying Coated Plates for Photo-Lithographic and Like Purposes and Apparatus Therefor. Pictorial Machinery Ltd. and L. Linzell. *British Patent No. 584,615.* In an apparatus for drying coated photo-litho and photo-engraving plates, etc., a sub-atmospheric pressure is produced in the casing below the plate support and heated air is thereby made to flow downwards through the lid-aperature, around the outer periphery of a coated plate on the plate support, and down to a situation below the latter. *Printing Abstracts* 2, No. 5, May, 1947, p. 200.★★

The Litho Process as Used in Carton Printing. Practico. *Paper Box Bag Maker* 104, No. 3, pp. 72-3 (September, 1947). The introduction of offset-litho to the printing of folding boxes, cartons, and the like, is of fairly recent origin, although its use is now well established. The types of offset press used for this purpose are of all-rotary construction, flat beds being too slow for competitive work. The techniques, including methods of plate preparing, press adjustments, and preparation of inks, are briefly outlined. The pile delivery of the printed boards being extremely rapid, setoff troubles must be prevented. A spray of spermacetti or even paraffin wax gives the desired degree of protection between each board, the usual volatile liquid employed for paper being inadequate. When compounding the inks, their acid or alkali reaction must be taken into account.

Since cartons are frequently waxed on one or both sides after printing, colors which bleed or change character under hot wax must be avoided. *Bibliography of the Institute of Paper Chemistry* 18, No. 6, February, 1948, p. 394.

•ADDING OR REMOVING IMAGES FROM LITHO PLATES AFTER THEY ARE ON PRESS. *Fuchs and Lang Litho Letter,* November, 1947 (4 pages). This article deals with the proper procedures for adding and removing images from litho plates after they are on the press. Correct tools and a step-by-step explanation of the most effective methods of their application for removing or adding large or small areas of work on albumen, deep etch, zinc and aluminum plates are suggested.

Plate densitometry

•A NEW METHOD OF MEASURING PLATE SENSITIVITY. George W. Jorgensen. *Modern Lithography* 15, No. 6, June, 1947, pp. 45, 85 (2 pages). The Principal variables which can change and affect plate sensitivity are: relative humidity, elapsed time before and after exposure, and thickness of the coating. A new Sensitometer is described and a method is given for its use in investigating the effects of these variables on light sensitivity in order that correct exposure adjustments may be made.

Planographic printing surfaces—general

•ADHERENCE OF PHOTO-MECHANICAL LAYERS TO THEIR BASES, PART I. P. C. Smethurst. *Process Engravers' Monthly* 54, No. 643, July, 1947, pp. 170, 173 (2 pages). The importance of insuring adequate adherence between a photo-sensitive layer and the base on which it is coated is presented along with a general outline of the physical and chemical factors involved. The problem of adherence is split up into three sections: (1) the wetting factor, (2) the character of the base surface, and (3) chemical reactions involved between layer and base.

•ADHERENCE OF PHOTO-MECHANICAL LAYERS TO BASES, PART II. P. C. Smethurst. *Process Engravers' Monthly* 54, No. 644, August, 1947, pp. 198, 201 (2 pages). If a light sensitive coating is to be applied to a non-metallic surface, such as one of the newer organic materials, it must be treated so that water will wet it. A swelling agent such as alcohol, acetone, acids or bases is suggested, with the addition of a wetting agent if necessary. The addition of a hardening agent such as chrome alum to the light sensitive coating solution is discussed and the dangers in its use are pointed out. It is stated that a chemical reaction occurs between certain metals and a bichromated colloid in which the bichromate is reduced so that a layer of partially hardened colloid forms in contact with the base. Less exposure is thus needed.

Processes for the Treatment of the Surfaces of Light Metal Objects. Langbein-Pfanhauser-Werke, A.-G. *British Patent Application 24,323/39.* A sensitive coating is applied to the surface of a light-alloy metal plate. The coating may be of chromogelatin or albumen dichromate. Various treatments may be applied to give an image on the metal. For instance, the plate may be exposed through a diagram and developed to remove the

soluble portion of the coating., The portion of the plate thus revealed may be anodized and dyed. Alternatively, an etching treatment may be given. According to treatment different types of surfaces may be obtained. The plates bearing the image may be used for printing. *Photographic Abstracts* 27, Part 3, No. 107, p. 143 (1947).

Albumin plates

• COATING SOLUTION TROUBLES. Charles F. King. *Inland Printer* 120, No. 2, November, 1947, pp. 65-68 (4 pages). The question of whether, with albumin type plates, the ink penetrates the albumin image or lies on top of it during printing is discussed. The author offers the hypothesis that the hardened coating might be penetrated by the developing ink, perhaps through pores, cracks, crazes, or fine reticulations. The application of this hypothesis to explain some types of plate faults is made.

• FACTORS INFLUENCING RATE OF DETERIORATION IN DRIED EGG ALBUMIN. G. F. Stewart and R. W. Kline. *Industrial and Engineering Chemistry* 40, No. 5, May, 1948, pp. 916-919 (4 pages). The effect of several factors effecting the deterioration of stored dried egg albumin was studied. As the temperature is increased, the solubility of the albumin decreases with time, and decreases much more rapidly as the storage temperature is increased. The fluorescence of the samples at 40°C or higher increases rapidly with time to a maximum and then declines. The decline in fluorescence seems to be related to increase in insolubility of the albumin. As the pH is decreased, the rate of solubility loss with time decreases considerably. The less H_2O content, the less the loss in solubility with time. At concentrations of glucose above .02%, an appreciable increase in fluorescence occurs with a decrease in solubility of the albumin, and development of color.

• WOOL FELT – THE IMAGE KILLER. *Modern Lithography* 16, No. 4, April, 1948, p. 117 (1 page). The use of wool felt in developing albumin plates results in the removal of part of the greasy film which rests on the image areas. This may lead to trouble in rolling up plates on the press, due to a partial densensitization of the image areas. It is recommended that platemaking procedures be adjusted, by use of pre-etched Cronak or Brunak plates, and proper coating thickness, so that development can be done with cotton only.

Deep etch plates

• MAKING DEEP ETCH PLATES. Don Grant. *Modern Lithography* 15, No. 8, August, 1947, pp. 34 and 35 (2 pages); *Printing* 71, No. 8, August, 1947, pp. 78-9 (2 pages). This article points out that the process of making deep etch lithographic plates is actually no more difficult than making surface plates. It can be reduced to four basic operations, all of which are familiar to the platemaker, namely: sealing the plate from all outside influence; chemically cutting and stencil; forming an image; and removing the stencil. Each of these steps is described and illustrated.

•Preparing Gum Arabic Solutions for Lithographic Coatings. A. G. Arend. *Paper and Print* 20, No. 3, Autumn, 1947, pp. 212, 214 (2 pages).

Different samples of gum arabic produce solutions of different viscosity. The solutions produced from powdered gum arabic are less viscous than those produced from selected lumps. It is recommended that the gum be placed in a cloth bag for dissolving to prevent dispersion of the type of gum arabic which produces a stringy solution. There is no definite relation between density and viscosity with gum arabic solutions. How much of the coating thickness is due to viscosity and how much to density is still controversial. Care must be exercised to have no particles in the finished coating which will produce specks on the plate.

Bimetallic plates

• BI-METALLIC PLATES. J. S. Mertle. *National Lithographer* 54, No. 7, July, 1947, pp. 28-9 (2 pages). A brief history is given of various early patents and developments with regard to the use of metals as substitutes for stone in lithographic printing. Types of bi-metallic surfaces mentioned are: (1) coated iron plates; (2) steel plates, or printing surfaces steel-faced in the non-image areas; (3) copper-surfaced zinc plates from which the copper film could be removed from non-image areas; (4) zinc plates on which copper was deposited on the developed litho image; (5) aluminum plates with metallic coatings; (6) plates on which the non-image areas were covered with an electrolytic deposit of another metal; (7) printing surfaces on which, after transfer or development of the image, either the non-image or printing areas were nickeled; (8) iron plates with a surface coating of either brass or copper; and (9) mercurographic plates.

• BI-METALLIC PLATES. J. S. Mertle. *National Lithographer* 54, No. 8, August, 1947, pp. 26-7 (2 pages). This second article of a series dealing with bi-metallic plates is devoted to mercurographic processes. Brief descriptions and references are given to the following processes: Noad, Husnik, Renck, Casanova, Block, Lenzart, Res, and Pantone.

• BI-METALLIC PLATES, PART III. J. S. Mertle. *National Lithographer* 54, No. 9, September, 1947, pp. 28-9 90 (3 pages). In this third part of an article reviewing efforts made to produce finer litho plates with various metals and processes, the following plates are discussed: Bower-Gauntlett, Strecker, Price, Desolle, Bull, Lowe, and Goodwin.

• BI-METALLIC PLATES. PART 4. J. S. Mertle. *National Lithographer* 54, No. 10, October, 1947, pp. 34-5 (2 pages). Part 4 of a series of articles on bi-metallic litho plates. The Murray process (Cu-Ni), Cornwall process (Fe, Zn or Fe, Al), Knudsen process (Zn on Zn); and Kohn process (Zn, Ni) are discussed. The development of cold top enamel and Tritton's experiments on the adsorption of oleic acid on various metals are reviewed.

• BI-METALLIC PLATES. J. S. Mertle. *National Lithographer* 54, No. 11, November, 1947, pp. 38-39 (2 pages). Part five of a review of methods for the preparation of bi-metallic plates and related methods. A. R. Trist patent (1936) claims that chromium can be made grease attractive by treatment with hydrochloric acid and passive to grease by treatment with nitric or chromic acid and potassium bichromate. Another method uses a non-metallic intermediate layer on a base metal, on which is placed a thin layer

of a metal different from the base metal. The non-image areas are etched to the intermediate layer, and the layer is then removed by washing. A discussion is given of Huebner's method of deep-etch platemaking (U. S. 2,042,003) which is not a bi-metallic process, but involves an oxidation of the image areas of the plate.

• BI-METALLIC PLATES. PART VI. . S. Mertle. *National Lithographer* 54, No. 12, December, 1947, pp. 36-7 (2 pages). Part six of a review of bi-metallic plates. In the Boeckelmann-Elfers process, a brass base metal was coated with electrolytic lead in the non-printing areas. The lead was said to be water-receptive, but suffered because of its softness. In the Hindriklaam, Boeckelmann, Elfers process, lead was deposted on a strong base metal, then copper on the lead. The copper was etched away to expose the lead on the non-printing areas. Another similar process substituted nickel for the copper. Hansen used stainless steel for the base metal, on which copper was deposited. An image was placed on the copper and the non-image areas etched through to the steel. The Hanns Eggen process was similar, but used zinc or aluminum as the base metal. Copper was plated on the image areas.

• BI-METALLIC PLATES. Part 7. J. S. Mertle. *National Lithographer* 55, No. 1, January, 1948, pp. 36-37 (2 pages). Part Seven of a review of bi-metallic plate processes. The Aller process (British Patent 483,349; U. S. Patent 2,214,950) is essentially the same as the earlier Hansen process. Copper is electroplated to .0008" on stainless steel, the jmage developed on the copper, and the non-image areas then etched through to the water-receptive stainless steel. This process is in use at present in Copenhagen. The Walter Hugentobler process (French Patent 831,185) employs five layers, starting with an iron base on which nickel, copper and zinc are plated. Following development of the image, zinc, then chromium are plated on the non-image areas. This method was simplified somewhat in a later patent (British 500,829). Stainless steel served as the base metal for a 1939 Canadian process. Then a zinc-aluminum alloy was plated on the steel. In the Alkuprint process (British Patent 475,588) a copper alloy was plated onto an aluminum base. An image was transferred to the copper alloy, then the alloy was etched down to the aluminum base in the non-image areas.

•Bi-Metallic Plates. J. S. Mertle. *National Lithographer* 55, No. 2, February, 1948, pp. 34 and 35 (2 pages). Part eight of a review of bi-metallic plates. The early Dodge patents did not involve bimetallic plates. Huebner's 1913 patent (Canada 147,713) involved a zinc or steel plate, with copper or nickel plated on the non-image areas. The Hausleiter process (1940) employs a brass vase, on which stainless steel of high nickel content was electroplated in the non-image areas. Hausleiter's 1945 patent (United States 2,369,567) specifies several types of bi-metallic plates. The Zack patent (German 701,827) is a modification of the old mercury amalgam plates.

• BI-METALLIC PLATES (Part 9). J. S. Mertle. *National Lithographer* 55, No. 4, April, 1948, pp. 30, 31, 75, 76 (4 pages). Part 9 of a review of bi-metallic plates. The preparation of the IPI tri-metal plate is described in detail, including method of electroplating, sensitized coating used, and composition of developer and etching solution. In

the process of Petren and Sternberg, a resist is laid down on a stainless steel base, then, following development, the image areas are etched with a mixture of calcium chloride, ferric chloride, nitric and hydrochloric acids and cuprous chloride. It was claimed that a thin film of copper was deposited in the image areas. Blau's electron intaglio stainless steel. This process is in use at present in Copenhagen. The Walter Hugentobler process (French Patent 831,185) employs five layers, starting with an iron base on which nickel, copper and zinc are plated. Following development of the image, zinc, then chromium are plated on the non-image plate is discussed. The image is applied to the base plate, using bichromated albumin or cold top enamel. After the image is developed, nickel is electroplated on the non-image areas. This method should not be confused with Blau's Electron-o-plate apparatus which is not a bi-metallic plate process. In the Electron-o-plate method an albumin image is developed on a zinc plate, and then a thin layer of zinc is electroplated on the non-image areas.

***Bimetallic Lithographic Plates.** G A. H. Elton*Patra Journal* 10, No. 5, November, 1947, pp. 118-127 (10 pages). An extensive discussion of bi-metallic plates. These processes are divided into four groups. In the first group the second metal is deposited on the base metal by a chemical process and no electricity is used. In the second group, the second metal is deposited on the base metal in the image or non-image areas after the image has been transferred to the plate. In this group are the Hausleiter, Boekelman and Elfers and Hugentobler processes. In the third group the second metal is deposited on the base metal before the image is transferred to the plate, and then the surface metal is etched down to the base metal in the image or non-image areas. In this group are the Coates Brothers, IPI, Aller and Alkuprint processes. The fourth group includes miscellaneous processes. The choice of a suitable bimetallic plate process is discussed.

* INTEREST IN BI-METALLIC PLATES FLARES UP IN STATES. *British and Colonial Printer,* Vol. 141, No. 990, October 24, 1947, pp. 252-3 (2 pages). A discussion of the Aller bimetallic plate (copper plated on stainless steel). A reply by Mr. Arthur Southway to criticisms of the process by Mr. Sidney Blau and Mr. Hugo Knudsen. The history of the Aller plate is reviewed and the method of making it is described. At Aller's Copenhagen plant, a weekly periodical of about 500,000 circulation is run off on one set of plates per page. It is claimed that the process bids fair to revolutionize lithographic printing.

* THE ADVENT OF THE BI-METALLIC PLATE. *British and Colonial Printer* 141, No. 994, November 21, 1947, pp. 309, 322-3 (3 pages). The report of an address by Mr. Arthur Southway on the aims of bi-metallic plates, and the method of preparation of the Aller bi-metallic plate. In the Aller process, copper is deposited electrolytically on stainless steel. A resist is applied, using a positive. The plate is developed to expose the copper in the image areas. The image areas are then "developed" electrolytically. The stencil is then removed, and the copper is dissolved from the non-image areas with acids, leaving on the plate only the copper which has been protected by electrolytic development. The protective electrolytic coating is removed with a mild abrasive, and the copper areas

are greased with ink and asphaltum to make the copper image areas ink-receptive on the press.

• THE TRI-METAL PLATE. Paul Whyzuzis. *National Lithographer* 54, No. 11, November, 1947, pp. 40, 41, 103-5 (5 pages). A discussion of the IPI "trimetal" plate, including a summary of the method of making the plates, and, results of typical press runs. One plate has run 3,000,000 impressions on line work.

• AN OPINION FROM GREAT BRITAIN ON BI-METALLIC PLATES. Arthur Southway. *National Lithographer* 54, No. 8, August, 1947, pp. 32, 96 (2 pages). A number of statements made by Sidney Blau in the May, 1947, issue of *National Lithographer* regarding bi-metallic plates are refuted. The Aller bi-metallic plate is described. It is of stainless steel with copper electrodeposited on the whole of one side. The plate is coated with a resist and put in a whirler, and again printed down as normal with photolitho plates. The subsequent developing of the image, after printing down, is done electrolytically and the time taken is very little in excess to that taken for making an ordinary deep etched plate. Gumming up of the plate is not necessary, even though the plate is left for a number of days.

• TRI-METAL PLATE. *National Lithographer* 54, No. 8, August, 1947, pp. 68, 70 (2 pages); Modern Lithography 15, No. 8, August, 1947, p. 73 (1 page). The IPI Tri-Metal Plate recently developed by the International Printing Ink Research Laboratory is composed of three layers of metal—chromium, copper and a base metal. The latter was originally steel but is made of zinc at the present because of unavailability of steel. Examples are cited of runs of over one-half million impressions with these zinc-based plates, and of experimental runs with steel-based plates which have given one to three million impressions. Processing the IPI Tri-Metal Plate is essentially the same as methods used for a conventional deep-etch plate. The chromium plating is removed from the design area, exposing the copper. Characteristics of this plate include wear resistance, physical toughness, and clean and sharp printing through the entire run.

• COATES BROTHERS DEVELOP BI-METALLIC PLATE. N. Skinner. *British and Colonial Printer* 141, No. 994, November 21, 1947, p. 320 (1 page). A new bi-metallic plate has been developed by Coates Brothers. The principle is similar to the IPI tri-metal plate except that a copper sheet is used as the base metal, on which a thin layer of chromium is deposited electrolytically. The plate is ungrained. The largest run has been 250,000 with no signs of wear at the end of the run. It is claimed that less dampening water is required, and only water is used in the fountain.

Bi-Metallic Plates and Graining.** ***British and Colonial Printer and Stationer **142, No. 1006, Februray 13, 1948, p. 106 (1 page). While zinc and aluminum plates must be grained to hold water, bi-metallic plates need no grain. Chromium or stainless steel is used for the non-image parts of the plate. These metals resist both wear and oxidation, and have an affinity for water instead of grease. To use such a plate the form rollers must be set accurately to avoid skidding. The lack of grain enables a lithographer to print a sharper line or dot.**

Method of Producing a Stainless

Steel Lithographic Plate With a Copper Image Thereon. Torsten Seved Alexander Petren, Fullesta, Huddings, and Erich Karl Willi Sternberg, assignors to Ahlen and Akerlunds Forlag. *United States Patent No. 2,429,107* (October 14, 1947). A method of manufacturing a printing plate for offset printing, the ink repellent and ink transferring surface portions of which lie in the same plane or have a level difference insufficient for such printing processes as relief process printing and intaglio printing, the plate comprising a stainless steel surface with greasy ink repellent and water receptive properties, characterized by applying a photographic light-sensitive layer to said plate, exposing said plate, developing the resulting image and treating the portions of the plate laid bare by development with an etching solution which contains copper chloride capable of producing a deposit of copper on said bare portions by metal displacement, said copper forming an alloy with the stainless steel having a greater adhesion relatively to water-insoluble offset printing inks than the stainless steel of the plate, and washing away the hardened remainder of the light-sensitive layer; said etching solution containing cuprous chloride and ferric chloride. *Official Gazette* 603, No. 2, October 14, 1947, p. 320.

PHOTO-MECHANICAL PRINTING-SURFACES. Ahlen & Akerlunds Forlag, T. Petren, and E. K. W. Sternberg. *British Patent No. 564,753* (April 2, 1943). In the production of a planographic printing-surface on a metal plate having the property of repelling greasy ink by applying a photographic sensitive layer to the plate, forming a latent image therein, developing the image so as to lay bare portions of the plate, applying to such portions a solution containing a compound of a metal which has a lower electrolytic solution pressure and also a greater receptivity for greasy printing ink than the metal of the plate so as to deposit a thin layer of the first-mentioned metal on the areas laid bare, and thereafter removing the remainder of the photographic layer, the plate consists of or is coated with a non-oxidizable metal or metal alloy such as rust-resisting steel or steel alloy, or chromium or an alloy thereof. *Abridgements of Specifications, British Patent Office,* Group XX, p. 96.

PLANOGRAPHIC PRINTING PLATES WITH SILVER-COVERED PRINTING AREAS. P. J. Schoonenberg. *Dutch Patent Number 57,602.* It proved of advantage to sulphidize the silver parts. This layer of sulphide takes a fatty ink well, conducts electricity so that metals can be deposited thereon, and it is well visible on the shining surface of the other metal. *Printing Abstracts* 2, No. 10, October, 1947, p. 432; *Chemical Abstracts* 41, No. 14, July 20, 1947, p. 4394.

Progress in Offset Printing. Akomfina, Zurich. *Schweizer Graphische Milleilungen,* 1947, 66, (6), 249. (In German). This company has developed a method of producing a copper bronze intermediate layer between the base metal and the lacquered parts of the printing dots, and so combining the advantages of the metal-lacquer with deep etching. Sharp natural tones are claimed for the *Duroprint* process and, owing to the special method of etching, the amount of damping water can be reduced. *Printing Abstracts* 2, No. 8, August, 1947, pp. 321-2.

METAL PLANOGRAPHIC PLATE. W. A. Boekelman and A. Elfers. *Dutch Patent No.* 58,534 (November 15, 1946). The water-receiving area is covered with a thin oxide layer that refuses ink

without graining and coating with gum arabic. It consists of Ni, Fe, Co, Sn, or an alloy of these; this surface is treated with an acid the anion of which stands on the nonswelling side of the lyotropic series, e.g., $F\text{-}SO_4\text{-}Cl\text{-}Br\text{-}NO_3\text{-}I\text{-}CNS$, where the left anions occasion the least swelling. HF and H_2SO_4 gave good results. E.g., a copper plate is Ni coated; after degreasing, an image is developed in a layer of good durable lacquer. After developing, the plate is washed and treated with dil, H_2SO_4 or HCl, suffused with a 10% soln. of H_2O_2, and after half a minute action, washed again and dried. The plate is now ready, the lacquer receiving the ink and the areas with damp oxidized Ni refusing it. *Chemical Abstracts* 41, No. 14, July 20, 1947, p. 4393-4.

METHOD OF PRODUCING A STAINLESS STEEL LITHOGRAPHIC PLATE WITH A COPPER IMAGE THEREON. Torsten Seved Alexander Petren, Fullesta, Huddings, and Erich Karl Willi Sternberg, assignors to Ahlen and Akerlunds Forlag. *United States Patent No. 2,429,107* (October 14, 1947). A method of manufacturing a printing plate for offset printing, the ink repellent and ink transferring surface portions of which lie in the same plane or have a level difference insufficient for such printing processes as relief process printing and intaglio printing, the plate comprising a stainless steel surface with greasy ink repellent and water receptive properties, characterized by applying a photographic light-sensitive layer to said plate, exposing said plate, developing the resulting image and treating the portions of the plate laid bare by the development with an etching solution which contains copper chloride capable of producing a deposit of copper on said bare portions by metal displacement, said copper forming an alloy with the stainless steel having a greater adhesion relatively to water-insoluble offset printing inks than the stainless steel of the plate, and washing away the hardened remainder of the light-sensitive layer; said etching solution containing cuprous chloride and ferric chloride. *Official Gazette* 603, No. 2, October 14, 1947, p. 320.

PROCESS FOR THE PRODUCTION OF PRINT PICTURES ON PRINT BODIES. Egon Herbert Schwarz. *United States Patent No. 2,437,005* (March 2, 1948). A method of producing print pictures on metallic printing surfaces comprising the steps of treating the metallic surface on which the picture is to be produced with a lye, applying to the surface a layer of sensitized emulsion, copying the desired picture on the sensitized surface, developing the picture, and coating the surface carrying the picture with a solution containing a salt of a metal the position of which in the displacement series is below that of the metal of the printing surface, said metal salt being capable of forming an ink receptive metal deposit. *Official Gazette* 608, No. 1, March 2, 1948, p. 137.

***Bi-Metal Plates.** Sidney Blau. "National Lithographer" 54, No. 5, May, 1947, pp. 38-9, 88, 90, 92 (5 pages). The credibility of reports of various bi-metal and tri-metal plates developed in Europe is questioned. The Electron Intalglio Process, developed in this country, is described. This process produces an intaglio lithographic printing plate from a negative print on zinc or aluminum. The print is used as an electrically resistant insulating medium, and the bare metal areas are used as the surface receiving the porous electro de-

posit which builds up the non-printing image. The opinion is advanced that a nickel-steel-shellac plate is the ultimate lithographic plate. However, introduction of this type of plate awaits availability of certain materials.

Surface Printing Plate. W. A. Boekelman and A. Elfers. *Dutch Patent No. 55,871* (August 15, 1944). The water-receptive part of the surface is such that, without graining or gumming, ink is repelled; to this end it is made of chrome or an alloy chiefly consisting of chrome. The surface is generally wetted with water, though other liquids not dissolving the ink may be used, e.g. glycerol. The chrome surface may be defatted by an alkaline detergent and treated with an acid, the anion of which stands on the non-swelling side of the lyotropic series, i.e., $F\text{-}SO_4\text{-}Cl\text{-}Br\text{-}NO_3\text{-}I\text{-}CNS$ (the first ones are the less swelling ones.). *Chemical Abstracts* 41, No. 12, June 20, 1947, p. 3980.

*PATENTS AND OFFSET PLATES. Hugo Knudsen. *National Lithographer* 54, No. 7, July, 1947, pp. 26-7, 62-3 (4 pages). The author reviews the influence of the first graining machine and the first offset press in enabling lithography to come out of the stone age. He cites personal acquaintance with Aller Press of Copenhagen, Denmark, and positive knowledge that the Aller bi-metallic plate made possible 480,000 thirty-two page magazines in four colors each week from one set of plates. Mr. Aller was granted U. S. Patent 2,214,950, dated September 17, 1940, which claims that copper may be deposited on the stainless steel electrically, by spraying, or by chemical means. The article also states that shellac is not satisfactory as an image base for large offset plates, but that lacquer, or Vinylite resin, is better.

Plastic plates

PRINTING SURFACES. W. Fuchs. *British Patent No. 566,705* (July 5 1943). A planographic printing surface is prepared by pressing upon a gelatin surface containing an oxidizable salt such as the sulphate of iron, nickel, zinc, manganese, cobalt, or copper, or ferrous ammonium sulphate, an original prepared by drawing or writing with a pencil containing, in addition to the graphite, an oxidizing salt such as potassium, sodium, or ammonium dichromate or potassium ferricyanide. The reaction of the salts causes a hardening of the gelatin along the lines of the original, such that it will take greasy printer's ink, whereas the unaffected areas of the gelatin reject the ink. *Abridgement of Specifications, British Patent Office*, Group XVI, 1948, p. 66.

Printing Processes. Gestetner Ltd. and A. De Waele. *British Patent No. 593,561.* A printing surface is claimed which has been treated locally with silicols, silicones or the related polyhydroxy or polyoxy compounds (e.g., the diols or polymers or condensation products derived therefrom) to render the areas oleophilic. The backing may consist of stone, glass, paper, textile fabric or a cellulosic material such as regenerated cellulose. *Printing Abstracts* 3, No. 2, February, 1948, p. 71.

Photomechanical Printing Surfaces. Kodak, Ltd., E. E. Loening, and C. H. Mitson. *British Patent No. 565,752* (March 22, 1943). A method of producing a printing surface on a cellulose acetate sheet. The surface ishydrolyzed with sodium hydroxide solution. A stencil is formed on this surface, using a sensitized gelatin emulsion, exposed through a positive.

The plate is developed, exposing the hydrated cellulose in the image areas. Then the hydrated cellulose in the image is removed with the proper solvent. Modifications of this procedure are described also. *Abridgement of Specifications, British Patent Office* Group XX, 1948, pp. 117-8.

PROCESS FOR PREPARING PLATES FOR PRINTING MAPS AND DRAWINGS. E. E. Loening, assignor to Kodak Limited. *British Patent No. 585,929* (March 24, 1944). A cellulose acetate film is marked with an ink containing dye and cellulose nitrate. After bathing in caustic soda the cellulose acetate sheet is partially hydrolyzed except in those areas covered by the cellulose nitrate, which remain unaffected. By this means the hydrolyzed area becomes ink-repellent while the cellulose nitrate remains ink-receptive. The cellulose acetate film is thus converted into a plate suitable for printing. *Photographic Abstracts*, Part 4, p. 243. (1947).

PRINTING OR EMBOSSING SURFACES. Kodak Ltd., E. E. Loening, and C. H. Mitson. *British Patent No. 565,752* (March 22, 1943). A sheet of cellulose acetate having an ink-receptive surface is hydrolysed to a certain depth by treatment with an aqueous solution of sodium hydroxide. The sheet is then coated with a sensitized gelatin emulsion, exposed through a positive of the design and developed by a tanning developer. The unhardened parts are removed in the usual way, forming a stencil. The exposed portions of the hydrolysed layer are then removed by vigorous rubbing with a solution of zinc chloride lactic acid, copper ammonium hydroxide or other solvent of cellulose hydrate. The addition of ethyl lactate to the zinc chloride facilitates the removal. *Abridgements of Specifications, British Patent Office*, Group XV, pp. 27-8.

PRINTING SURFACES. Kodak, Ltd., E. E. Loening, and C. H. Mitson. *British Patent No. 565,752* (March 22, 1943). A method for the preparation of a printing plate directly from photographic film by means of a partial hydrolysis of the film in the non-printing areas, leaving a non-hydrolyzed ink-receptive surface for the printing areas. Several different methods for accomplishing this are described. *Abridgement of Specifications*, British Patent Office, Group XVI, Section 560,001-580,000, pp. 61-2.

Plate desensitization

* CELLULOSE GUM—A SUPERIOR DESENSITIZING AGENT. *Lithographers' Journal* 32, No. 3, June, 1947, pp. 10, 11 (2 pages). Cellulose gum eliminates most of the disadvantages of gum arabic. Tests made at the Lithographic Technical Foundation show the following results: plates treated with gum arabic begin to scum long before plates treated with cellulose gum; an added desentizing effect is obtained by the drying of a good cellulose gum pre-etch on the plate; and a Cronaked surface is more easily desensitized than a bare metal one. The advantages of cellulose gum are listed. Several important points to be considered in properly preparing a cellulose gum plate in order to achieve the best results are discussed.

* REPORT OF THE DIRECTOR OF RESEARCH, THE PRINTING AND ALLIED TRADES RESEARCH ASSOCIATION. PRINTING DIVISION. Annual Report, 1946-7, *PATRA*

Journal, September, 1947, pp. 14-19 (6 pages). Oleic acid will displace water from an aluminum plate. As gum arabic is added to the water there is less tendency for the oleic acid to displace the water at the surface of the aluminum. When the gum arabic concentration reaches about 0.3%, the aluminum is completely desensitized and repels the oleic acid. If a gum film is dried on a plate, the plate is desensitized even though it is wet by water alone. PATRA made a laboratory comparison of gum arabic and "Cellofas WFZ," or sodium carboxymethyl cellulose, in 1942. It is planned to undertake plant tests in the near future.

***Cellofas WFS, Litho Plate Desensitizer.** G. MacDougall, *Patra Journal* 10, No. 5, November, 1947, pp. 115-17 (3 pages). A Patra progress report on the use of Cellofas WFZ (carboxymethyl cellulose) as a desensitizing agent. This material was first tested in England in 1941, and further tests are now being carried out. These tests show that it does not sour like gum arabic does, and that it has a marked advantage over gum arabic in fountain solutions. Since the Cellofas solution contains only 5% solids compared with 25% for gum arabic, it is sometimes necessary to double gum plates to protect them from penetration of asphaltum. As a desensitizing agent, it has proved to be as efficient as gum arabic but there is no evidence to show it is superior. At present, plant testing of the material is being carried out.

* BRUNAK CONTROLS OXIDATION ON ALUMINUM PLATES. Michael H. Bruno and Paul J. Hartsuch. *National Lithographer* 55, No. 4, April, 1948, pp. 26, 27, 85 (3 pages); *Modern Lithography* 16, No. 4, April, 1948, pp. 51, 53 (2 pages); *Lithographers Journal* 33, No. 1, April, 1948, pp. 9-10 (2 pages). A process is described for the production of a chemical surface film on aluminum plates which protects the metal from oxidation. The process which has been named Brunak consists in the immersion of the clean, counter-etched grained aluminum plate in a solution of ammonium bichromate and hydrofluoric acid for 1-1½ to 3 minutes, followed by rinsing of the plate and drying of the film. The process gives the metal greatly increased protection against oxidation. Plates treated by the Brunak process may be used subsequently for either albumin or deep-etch offset plates. The use of Brunak eliminates the oxidation scum which is characteristic of an oxidized aluminum plate.

* PRESERVATION OF GRAINED PLATES. Robert E. Rossell. *Modern Lithography* 16, No. 1, January, 1948, pp. 49, 91, 93, 95 (4 pages). Tests made under tropical conditions on zinc and on aluminum plates indicated that the Cronak process gives best oxidation protection for zinc, while gum arabic with phenol gives the best protection on aluminum.

Moistening Printing Plates. W. de Jong. *Dutch Patent No. 55,746* (December 15, 1943). A little phthalate resin is made use of, not only in the ink but as an emulsion in the water to moisten the plate. The *resin* may be made from glycerol 166, phthalic anhydride 263, and linseed-oil acid 570 parts by weight, by heating 5 hours in a CO_2 atmosphere. An emulsion can be made from resin 100 in water 250 parts and some triethanolamine at 90°. Of this emulsion 1% in the water to moisten the plates suffices. *Chemical Abstracts* 41, No. 12, June 20, 1947, p. 4010.

***Use of Bichromated Gum Arabic.**

"British and Colonial Printer" 140, No. 966, May 9, 1947, p. 258. Questions regarding the use of bichromated gum arabic are answered. The tendency for streaks to appear across the design is discussed and instructions given to avoid this. The reason for scumming of plates if left a few days is also explained and suggestions given to prevent it. A method of recoating the plate on the press with bichromated gum is described. The thinness of the bichromated gum coating on plates permits them to be run with considerably less water than plates with normal gum coatings, and thus results in improvements in depth of color, sharpness of detail, and ink economy.

Fountain solutions

• FACTS VERSUS OPINIONS. Charles F. King. *Inland Printer* 121 No. 1, April, 1948, pp. 50-53 (4 pages). Questions are posed as to the purpose of bichromates, nitrates, and other ingredients of fountain solutions. The pH of fountain solutions is discussed with relation to ink, paper and different formulations of fountain etch. When properly used, pH can be a useful tool for the pressman. The mechanism of the adherence of desensitizing gums to metal plates is discussed. The necessity of molecules with carboxyl groups is questioned but no other mechanism of adhesion is proposed by the author.

pH control

***Acids, Bases, Salts—pH.** C. Ross Bloomquist. *Interchemical Review* 6, No. 2, Summer, 1947, pp. 31-48 (18 pages). **A review of the theoretical basis and practical applications of pH measurements.**

Plate grain

EVALUATION OF THE ROUGHNESS OF LITHOGRAPHIC PRINTING PLATES. G. A. H. Elton and G. McDougall. *J. Soc. Chem. Ind.*, 65: 212-15, July, 1946. Lithographic printing plates are generally sheets of aluminum or zinc about 0.01 inch thick, which are artificially roughened before use on the printing press. The metal sheets are secured to the bottom of a tray which can be vibrated rapidly in a horizontal plane with an eccentric motion. The sheets are covered with a single layer of spherical marbles and an abrasive with some water added. Plates can also be grained by sandblasting. For the evaluation of roughness, the surface properties selected for measurement were: (1) the roughness ratio, i.e., the ratio of the total surface area to its apparent area; (2) the specific surface volume, this quality being defined as the void volume per unit apparent area enclosed by the surface of the grain and a plane passing through the peaks of the grain; and (3) the grain depth, which is the shortest distance between a plane through the peaks of the grain and a plane through the lowest points of the troughs. Photographs and graphs are reproduced. *Monthly Abstract Bulletin*, Kodak Research Laboratories, 33, No. 4, April, 1947, p. 123.

***Vapor Blasted Grain.** E. G. Carlson. *Modern Lithography* 16, No. 2, February, 1948, pp. 57, 59 (2 pages); *Lithographers' Journal* 32, No. 11, February, 1948, p. 10 (1 page); *National Lithographer* 55, No. 2, February, 1948, pp. 39, 106 (2 pages). Mr. Carlson reports 23 successful vapor blasted plates run at Western Printing and Lithographing Co., with uni-

formity of grain achieved on 25-½" x 36" plates. All plates were made by the deep-etch process.

Offset presses

• OFFSET PRESS SPECIFICATION CHART. *Modern Lithography* 15, No. 5, May, 1947, pp. 46-49 (4 pages). A chart is given showing specifications on the various Hoe, New Era, Rutherford, ATF-Webendorfer, Sperry, Miehle, Champlain, Dutro, Willard, and Harris presses. The following information is given on each press: sheet size limits, maximum size print, minimum gripper margin, plate dimensions, plate thickness, cut of plate cylinder, blanket dimensions, blanket thickness, cut of blanket cylinder, speed range, feeder capacity, delivery capacity, number and sizes of covered inking rollers, number and sizes of covered dampeners, approximate weight, approximate floor space, and electrical specilcations.

PRINTING MACHINES. J. Chalmers. *British Patent No. 566,739* (June 7, 1943). An offset machine for printing of rough materials is constructed with a printing surface, a flat coplanar offset surface to which an offset impression from the surface is transferred by means of a travelling offset roller which is mounted in a reciprocating carriage moving in guides. This machine may be converted into an ordinary letterpress machine and may be operated by hand or power.

Dampening systems

WATER FOUNTAIN. Arthur G. Royer, assignor to Harris-Seybold Company. *U. S. Patent No.* 2,425,643, (August 12, 1947). In a water fountain for a printing press having a rotating form cylinder, an intermediate roller adapted to turn with surface speed substantially equal to the surface speed of the form cylinder, a pan roller, a ductor roller, a camshaft for moving the ductor roller into engagement with the intermediate roller and pan roller alternately, a transmission shaft with its axis disposed at right angles to the axis of said rollers, and separate worm and worm wheel connections for driving the transmission shaft from the intermediate roller and for driving the pan roller and the cam shaft independently from said transmission shaft. *Official Gazette* 601, No. 2, August 12, 1947, p. 297.

Apparatus for Applying a Tubular Fabric Cover to Rolls. Norman A. Mack, assignor to Roberts and Porter, Inc. *United States Patent No. 2,426,431* (August 26, 1947). Apparatus for mechanically jacketing a roller of a lithograph printing machine with a tubular sleeve of absorbent fabric, comprising a hollow mandrel dimensioned externally for a snug fit thereon of the major portion of the length of a tubular sleeve of absorbent fabric, means for supporting the mandrel, and means for forcibly moving the roller through the mandrel and stripping the sleeve off the mandrel and simultaneously causing the sleeve to embrace and surround the roller. *Official Gazette* 601, No. 4, August 26, 1947, p. 645.

SLEEVE ASSEMBLING APPARATUS FOR LITHOGRAPHIC ROLLS. Norman A. Mack, assignor to Roberts and Porter, Inc. United States Patent No. 2,431,407 (November 25, 1947). Apparatus for mechanically jacketing a roller of a lithograph printing machine with a tubular sleeve of absorbent fabric comprising a hollow mandrel dimensioned internally for snugly fitting

telescopically a roller to be jacketed, and dimensioned externally for a snug fit thereon of the major portion of the length of a tubular sleeve of absorbent fabric, means for supporting the roller, movable means for engaging the mandrel after the sleeve has been applied thereto, and reversible power operated means for moving said engaging means to telescope the mandrel and sleeve over the roller and to strip the mandrel therefrom. *Official Gazette* 604, No. 4, November 25, 1947, p. 657.

Inking systems

INKING APPARATUS. W. W. Triggs, assignor to Harris-Seybold-Potter Company. *British Patent No. 564,903* (March 11, 1943). In a lithographic printing-machine in which ink is transferred to the plate cylinder from two distributing drums, supplied from a single fountain, the ink is supplied to at least one of the drums by two rollers in contact with the drum, and ink is supplied to the rollers from the fountain so that each roller receives ink independently of the other. *Abridgement of Specifications*, British Patent Office, Group XVI, Section 560,001-58,000, p. 51.

• SPLIT-COLOR RUNS AIDED BY NEW DEVICE. *Graphic Arts Monthly* 19, No. 11, November, 1947, pp. 26 (2 pages). The Dayco Color Separator, a new device manufactured by the Dayton Rubber Co., Dayton, Ohio, is claimed to be the solution to split-color runs. This device is easily installed, does not interfere with normal operation of the press, and will work with any type of roller that is serviceable and accurate in circumference. Mounted on the press, it picks up ink from the rider rollers and automatically cleans all other rollers back to the ink fountain. Substantial savings from this new device are claimed in rollers, make-ready time, paper and press runs.

Offset press operation

• HOW TO OPERATE A SMALL OFFSET PRESS (Part 3). Eugene C. Moysen. *National Lithographer* 55, No. 4, April, 1948, pp. 28, 29, 66, 68, 70 (5 pages). Part 3 of a series on the operation of a small offset press. Discussion of water ductor roller adjustment, water control, clearing of water roller, cleaning and adjustment of plate cylinder, packing of the plate, positioning of plate on the press, adjustment of the impression cylinder, inking of the plate, and adjustment of the plate for position and register.

•How to Operate a Small Offset Press. Eugene C. Moysen. *National Lithographer* 55, No. 2, February, 1948, pp. 28, 29, 102-5 (6 pages). This is the second article of the series on operation of the offset press written particularly for the beginner. Parts of the press and press operations discussed in this article include: pressure bar, side and front guides, adjusting gripper bite, and the inking and dampening mechanisms.

• HOW TO OPERATE A SMALL OFFSET PRESS. Eugene C. Moysen. *National Lithographer* 55, No. 1, January, 1948, pp. 28-30, 76, 78, 80 (6 pages). This is the first of a series of articles intended to serve as instructions for operating a small offset press, primarily for men who have not worked on one before.

•REMEDIES FOR OFFSET PRESS TROUBLES. *Canadian Printer and*

Publisher 56, No. 6, June, 1947, pp. 50, 56 (2 pages). Preventable troubles in the offset pressroom can be classified as follows: sheet separation and control troubles; impression and surface travel troubles; dampening and inking troubles; and plate troubles. The factors involved in each type of trouble are discussed and suggestions given for remedies.

• STATIC CAN BE ELIMINATED. John Long. *American Printer* 124, No. 5, May, 1947, p. 31 (1 page). In tests carried on with air conditioning equipment it has been found that four factors control the generation of static, namely, paper, ink, impression, and absolute humidity. Static can be eliminated when the right conditions are set up. Air conditioning is the best answer to the static problem. However, a fair substitute during winter months is releasing steam with a fan behind it to circulate the air. It is pointed out, however, that it is of little use to condition the pressroom and then run paper just brought in from a dry atmosphere as paper that has lost its moisture content will generate static even in a conditioned pressroom.

STATIC ELIMINATOR. *Chemical and Engineering News* 26, No. 4, January 26, 1948, p. 270. The Alphatron static eliminator manufactured by the Gibbs Manufacturing and Research Corporation, Janesville, Wisconsin, consists of polonium electro-chemically plated on nickel and protected from dust and oxidation by a thin layer of gold. Polonium emits alpha particles of approximately 4 million m.e.v. These particles ionize the surrounding air and dissipate the accumulation of static electricity. The static eliminator can be furnished in almost any geometrical design and with almost any required intensity of alpha emission.

• CARE OF OFFSET ROLLERS. *American Pressman* 57, No. 9, August, 1947, p. 38 (1 page). Suggestions are given for proper care of rollers. A good method of washing rollers to remove all residue of pigment and varnish is described. Rollers must be thoroughly dried after washing to prevent their shrinking in spots. They should be inspected periodically for imbedded grains of sand or ink skins sticking to them, and these removed. Care should be taken that oil and wash up fluids, spilled over parts of the press, do not drip and run down over the rollers when the press is idle. Rollers should be carefully set. Those with high and low spots should be discarded or reground, but should not be set extremely hard in order to contact the low spots, as this gives a very hard contact at high spots.

RUBBER HARDNESS TESTER. *Instruments* 21, No. 3, March, 1948, p. 226. New "Rex Hardness Gage" for measuring hardness of rubber and similar compounds is the size and shape of a large fountain pen. is operated when an indenter at one end is pressed firmly against surface to be tested; reads in the same units as the Shore Durometer; meets requirements of latest ASTM rubber hardness test method. Manufactured by United States Rubber Company, Rockefeller Center, New York.

• "ERROR ANTICIPATION" DEVICE CORRECTS ANY MIS-REGISTER PRACTICALLY BEFORE IT OCCURS. Electronic Control Corporation. *Inland Printer* 119, No. 6, September, 1947, p. 59 (1 page). This is an application of the electronic computer

or "mechanical brain" developed at the Massachusetts Institute of Technology, Harvard, and other universities. The register is maintained with 0.001 inch or less between cylinders. The electronic element scans register marks which have been cut into the plate at four equidistant points around it. If the first cylinder, for instance, is out of time (out of register) the control "sees" the error at the next printing station or cylinder and starts correcting it immediately rather than waiting until the affected section of the web has left the press. In other words, the error that starts to occur on any one cylinder is so tiny that it is corrected so swiftly—in 0.15 second and before it has reached 0.001 inch—that it will not be apparent to the eye when the web leaves the press. Error signals received by the electronic element are relayed to hydraulic motors, which are geared to the cylinders of the press to keep them in synchronization or exact register with each other. The electronic control has been applied to a rotogravure press. *Printing Abstracts* 2, No. 12, December, 1947, p. 521.

VACUUM SHEET CLEANER FOR ANY TYPE CYLINDER PRESS. *Printing* 72, No. 1, January, 1948, p. 119. A vacuum sheet cleaner which may be installed on any cylinder press is being manufactured by the J. E. Doyle Company. The cleaner consists of vacuum nozzles extending the full width of the press cylinder, manifolds graduated in size to insure uniform vacuum, a connecting hose running down side of press to a highspeed motor-driven suction fan and a small bag, removable for emptying, to retain the collected dirt, lint, etc. Features claimed for the cleaner include better presswork, saving in press stops for washups, saving in ink.

KILOWATTS DRY INK FOR FAST PRINTING. E. D. Tillson. *Electrical World*, 1947, 128 (5), 63-4 (August 2; *Mead Corporation Books, Pamphlets, J. Articles*, 1947, 14 (8), 6 (D729.12/3985). Rectangular grids operating at 2,350° F. offer the printing industry a safer method than conventional open gas flames for drying inks. A safety curtain protects the paper web when the press stops. *Printing Abstracts* 2, No. 11, November, 1947, p. 457.

Newspaper printing by offset

***Summation of the Possibilities for Developing Improved Techniques in Printing Newspaper Color Supplements by Web-Offset-Lith—Problems Enumerated by LTF Web Offset-Lith Committee.** *Printing Equipment Engineer* 75, No. 1, October, 1947, p. 54 (1 page). Points brought out at the recent meeting of the Lithographic Technical Foundation's Special Web Offset Committee are discussed. The suggestion was made that studies be undertaken of the comparative basic production costs and time relationship among the typographic, lithographic and gravure processes, and of the advantages, economics, and limitations of photo-typesetting composition in closing the gap which now exists between the typographic and photomechanical techniques in newspaper production. Efforts should be made to enable offset to meet shorter deadlines, offer better quality work than letterpress for less or no more money, and to achieve uniformity of printing quality. There is a need for plates of better quality which will yield 2 or 3 million impressions, and for a good groundwood paper. The recently developed letterpress heatset inks (if successful) may deter offset development since if gloss surface-lay inks can be developed to use on existing equipment at very small

mechanical adaption costs, using the same methods and routines, newspapers are not likely to switch to the new presses, equipment, methods, techniques, and labor required by offset.

***Lithography With Web Offset Presses.** Charles F. Geese. *National Lithographer* 55, No. 2, February, 1948, p. 36 (1 page). It is pointed out that if the volume and quality of offset web printing is to improve to any great extent, not only must the weaknesses of the entire offset process be recognized and steps taken to overcome them, but also the extra speed achieved by web offset should be considered in choosing equipment and materials. New developments such as the bimetallic plate which will run 1,000,000 impressions, an ink fountain that can be set for any coverages of ink, and the replacement of cloth dampeners are mentioned as possible aids in making web offset more dependable.

* MAY DEVELOP WIDER WEB PRESS USES. *Modern Lithography* 15, No. 8, August, 1947, p. 47 (1 page). The report of the Lithographic Technical Foundation's Web Press Committee Meeting in June, 1947, indicates that web offset presses, already in wide use for specialized types of work, may find an even more important role in the lithographic industry. Inks, papers, bi-metallic plates and presses are available that will do a commercially satisfactory web offset job in monotone and color. The Committee agreed that, upon completion of the study of mechanical graining, worthwhile research by the Lithographic Technical Foundation would be an investigation of the wettability of various metals or the lithographing properties of metals or bi-metallic combinations. This research should effect improvement in sheet fed as well as web offset plates.

*INFRARED DRYER APPLIED TO WEB OFFSET PRESS. *Printing Equipment Engineer* 75, No. 4, January, 1948, p. 15 (1 page). An explanation and illustrations are given of the installation of Doyle Web Offset Infrared Duplex Drying Units on an ATF Webendorfer Web Offset Press at the Haynes Lithograph Co., Silver Spring, Maryland. Two Doyle 36" drying units are mounted above the offset impression cylinder. The drier units, when the press is in operation, are positioned within a few inches of each side of the web. Current is turned on and off automatically when the press is started or stopped. To prevent scorching of the web from residual heat in the coils, when the press is stopped the pressman turns the handwheel to pull the units approximately 18 inches away from the web. The drier can also be adjusted at variable distances from the paper web to suit various purposes such as changes in paper stock, kinds of ink and other factors.

Stripping methods

MASKING PAPER SUCH AS FOR LITHOGRAPHY. Frank A. Marty. *United States Patent No. 2,429,271* (October 21, 1947). A lithographic masking paper comprising a stock sheet dyed an orange to a yellow color which is relatively transparent and the dye of which is insensitive to alkali, a coating of a mixture of clay and a sizing upon the sheet of stock, and a coating of a mixture of silicate of soda and an equalizer over the clay coating. *Official Gazette* 603, No. 3, October 21, 1947, pp. 435-6.

* PHOTO - LITHOGRAPHY: PREPARATION OF A KEY PLATE.

C. C. Redman. *Process Engravers' Monthly* 55, No. 650, February, 1948, pp. 38, 41 (2 pages). Instructions are given for preparations of key plate, non-greasy images without printing quality, by photomechanical means from either a negative or positive transparency or by duplication from an existing printing plate.

Metal lithography

• PAST–PRESENT–FUTURE OF METAL DECORATING. Clarence W. Dickinson. *National Lithographer* 54, No. 12, December, 1947, pp. 26-7, 82, 86 (4 pages). An interesting history is given of metal decorating presses from the origin of the tinning of iron plates nearly 200 years ago to the Hoe Company's heavy duty metal decorating press which operates at speeds up to 4,500 lithographic impressions an hour and automatically handles metal sheets as large as 48" x 72".

• PIGMENTS FOR METAL DECORATING. W. F. Spengeman. *National Lithographer* 54, No. 12, December, 1947, pp. 30-1, 92, 101, 104 (5 pages). Inks for metal decorating require high strength pigments that will not bleed or emulsify in the fountain solution or promote "greasing," are capable of being readily ground to adequate fineness, and, since metal decorating inks are dried by baking, pigments that have good baking qualities. Due to the variety in metal decorating work, requirements for pigments also vary over a considerable range. The following pigments, and the choice of the correct ones to obtain the particular properties desired, are discussed: white, black, chrome yellows and oranges, molybdate orange, blues, greens, reds, and other colored pigments.

Decalcomania

• DECALS GROSS MILLIONS. A. G. Fegert. *Printing* 72, No. 3, March, 1948, pp. 53-55, 62 (4 pages). The process of manufacturing decalcomanias is discussed and the difference in procedure for "face up" and "face down" decals is described. Decals may be printed by letterpress, offset-lithography, gravure or silk screen and sometimes two or more processes are used for one decal. Decals of all sizes are produced from tiny stamps up to 5 x 6' designs. Decals are now on the market designed for use on cloth, glass, baked enamel, wood, plastics, rubber and metals. The growth and activities of the Meyercord Company in the decalcomania field are discussed.

DECALCOMANIA PAPER. John W. Stewart, assignor to The Cuneo Press, Inc. *United States Patent No. 2,425,653,* (August 12, 1947). The method of preparing non-curling decalcomania paper, which consists in releasably bonding, to one side of a backing sheet of water absorbent paper, by a water-soluble starch-dextrose adhesive, a coating adapted to take a decalcomania design, and covering the opposite side of the sheet with a dried layer of granular gelatine which has been swelled in a warm mixture of water and alcohol in a ratio of generally three to two. *Official Gazette* 601, No. 2, August 12, 1947, p. 299.

Lithographic papers—general

***How the Pulp and Paper Research Institute is Aiding the Industry.** *Pulp and Paper Magazine of Canada*, 1947, 48 (5), 61-6 (April). In this review of the work of this institute a brief summary is given of its investigation into the determination of the smoothness of paper, the rate of oil absorption into paper and the structure of paper. *Printing Abstracts* 2, No. 8, August, 1947, p. 310.

***What the Printer and Lithographer Want in Paper. W. Rennie.** *Paper-Maker and British Paper Trade Journal* 113, No. 6, June, 1947, pp. 342, 344 (2 pages). While humidity control is of foremost importance to the printer and lithographer in the handling of paper, other troubles encountered with paper are: (1) paper which is not cut square; (2) grain running both ways in the same shipment; (3) improper ink absorbency; (4) trouble with "markers" or "ream-dividers," (5) chemicals, such as caustic soda and alum, used in paper making, (6) creases in paper as received from the mills; (7) variation in sizes and lack of uniformity in thickness; (8) unsuitable printing surfaces; and (9) coated paper deficiencies. *Printing Abstracts* 2, No. 8, August, 1947, p. 311.

* PAPER PROBLEMS OF THE PRINTER. Oliver Watson. *Paper Industry and Paper World* 29, No. 5, August, 1947, pp. 673-676 (4 pages). Paper problems encountered in the printing and offset processes are discussed. Characteristics desirable in paper for these two reproduction methods are listed. Advantages of coated paper over uncoated paper, conditions affecting quality of coated paper, and problems peculiar to it are also discussed.

* PAPER STANDARDIZATION AS AN AID TO THE PRINTER. M. S. Kantrowitz and E. W. Spencer. *Paper Industry and Paper World* 29, No. 9, December, 1947, pp. 1306-8 (3 pages). Until paper is standardized, the printer is handicapped in his selection of paper for any given purpose by lack of knowledge of the basic qualities of the many papers offered by the different manufacturers for the same purpose. Standardization would effect economy and maximum efficiency in the use of paper in the printing industry. Paper standardization includes size, weight, quality and packaging. Experimental steps taken by various organizations in the direction of paper standardization are discussed.

* PROBLEMS IN 24 SHEET POSTERS. Robert F. Reed. *Modern Lithography* 15, No. 9, September, 1947, pp. 40-1 (2 pages). Work done by the Lithographic Technical Foundation on the problems of flagging and splitting or popping-off of posters is discussed. Flagging is caused primarily by a combination of tension in the sheet and a tendency of the sheet to curl away from the board as a result of superficial drying, while the paste is still wet underneath. This combination of forces probably exists in every poster during drying but whether or not it results in flagging depends on contributing conditions which either aggravate the tendency of the sheet to shrink and curl, or which reduce adhesion at the laps thus allowing curl to start. These conditions are described and recommendations are made for the prevention of flagging. Tests show the breaking of sheets while being posted was due to low strength of the wet paper, and splitting or popping-off while the sheets were drying on the obards was due to lack of

stretchability; in other words were the direct result of unsatisfactory paper properties.

***Handling Gummed Paper on the Offset Press.** K. O. Bitter. *Modern Lithography* 16, No. 2, February, 1948, pp. 30-32, 99 (4 pages). The characteristics of gummed paper and special precautions to be taken when handling it are discussed. Case histories are given showing the importance of paper seasoning in avoiding curling or waving of edges, change of size between color resulting in poor register, and wrinkling. Corn starch rubbed over hands and forearms of people handling the sheets proves valuable in preventing sheets from sticking together. Varnishing, diecutting, wrapping and shipping, and storage of gummed paper are described. Some uses of lithographed gummed products are listed.

Paper materials

***Paper Problems in Printing and Conversion.** Robert F. Reed. *Southern Pulp and Paper Manufacturer* 11, No. 2, February 15, 1948, pp. 58-61 (4 pages); *Pulp and Paper Magazine of Canada* 49, No. 2, February, 1948, pp. 69-72 (4 pages). To give the best service, paper must be selected and purchased on the basis of its suitability for the purpose intended, and it must be used intelligently and with full knowledge of its properties, reactions, and limitations. This article discusses the basic properties and characteristics of paper, and their relation to some of the troubles encountered by printers and converters. Among the inherent properties that must be reckoned with are grain, twosidedness, density, and hygroscopicity, as well as strength properties. Important also are flatness, dimensional stability, bond strength, ink receptivity, and ink-drying properties. The imhportant effect the moisture content of paper has on many of its working properties is pointed out. Paper conditioning and the use of the Paper Hygroscope are discussed.

* PRINTER'S PAPER TROUBLES. R. H. Simmons. *Paper Mill News* 70, No. 32, pp. 12, 14, 16 (August 9, 1947). The author discusses the characteristics of paper which cause trouble for the printer, emphasizing that the paper troubles are related to the method of printing (typographic, planographic, or letterpress).

* PAPER ESSENTIALS FOR OBTAINING BEST RESULTS IN OFFSET PRINTING. *Canadian Printer and Publisher* 56, No. 9, September, 1947, p. 56 (1 page). Some fundamental considerations which will influence the estimator in his offset paper decisions are moisture, tackiness and pressure. These factors combine to change the shape and size of stock at each impression. The paper grain should always run parallel to the length of the cylinder, even for one color work. Paper should be guillotine trimmed before entering the press to provide straight, square edges. Sizing is necessary to prevent lint and fuzz to insure cleanliness of the plate and blanket, as well as to modify moisture penetration. The paper merchant and manufacturer should be kept informed of the type equipment, single or multicolor; the kind of temperature and humidity control; utility of printed material; and any peculiarities of finishing operations the paper will be subjected to. The estimator should keep in mind that the characteristics of the stock, more than any other factor, controls machine running time.

***CHARACTERISTICS DESIRABLE IN OFFSET PAPERS.** Robert F. Reed. *1947 Yearbook of the American Pulp and Paper Mill Superintendents Association, Inc.*, pp. 180, 182, 184, 187 (4 pages). Requirements of papers, both for sheet-fed offset and web offset, are discussed. The solution to many feeding and register problems lies in correct handling of the paper. Conditioning of paper, use of the Paper Hygroscope to determine if paper is in equilibrium with atmosphere, trimming paper with straight edges and square corners are all important in avoiding misregister. Different types of picking of coated and uncoated papers and their causes are discussed. The wax pick test is helpful in standardizing pick resistance of any given stock but an improved testing method that would cover a larger area and would not involve heating the paper surface is needed. Ink drying problems, scumming and tinting, as they are concerned with paper, are also covered.

***Report of the Printability Committee.** *Pulp and Paper Magazine of Canada* 48, No. 5, April, 1947, pp. 75-81 (7 pages). A review of published articles on printability of papers, classified under the heads: printing properties of paper; testing methods; printing inks; and printing processes. The bibliography contains 38 references.

***ELIMINATING WRINKLES IN PAPER.** M. S. Kantrowitz. *Share Your Knowledge Review* 28, No. 9, June, 1947, p. 18 (1 page). The use, by the Government Printing Office, of infrared lamps to apply heat to the edges of paper while it is in the feeder pile is discussed. The application of radiant heat drives out some of the excess moisture at the paper edges and so causes the wavy stock to straighten out again. The arrangement of the infrared lights for this purpose is described.

***FLOAT FIBERS—THEIR EFFECT ON PRINTING.** T. Linsey Crossley. *Paper Industry and Paper World* 29, No. 6, September, 1947, pp. 838-840 (3 pages). The term "float fibers" incldes the four following types of paper flaws: slitter dust; fibers partly enmeshed in the surface of the sheet; loose fibers between sheets in skids or rolls; and fibers whose impressions only remain on the sheet. The causes of these various types of flaws, their effect on printing, and their prevention are discussed.

***RELATION OF GLOSS TO COLOR.** Richard S. Hunter. *Paper Trade Journal* 126, No. 2, January 8, 1948, pp. 47-50 (4 pages). Gloss is a variable which must be considered in addition to color when one is studying the factors of appearance. Traditionally, color is associated with diffuse or pigment reflection, while gloss is associated with specular or surface reflection. Specularly reflected light is generally nonselective (gray). It may be said to cause a gray component to be added to the colored (pigment) component of reflection in amounts which vary with the gloss and the directions of observation and illumination of any specimen. Thus the color of a specimen tends to vary with the directions in which it is illuminated and viewed. These directions must therefore be standardized in any method for measuring color. Similarly, the geometric conditions of any gloss measurement must be carefully standardized if one is to duplicate the gloss measurements of others. There are not one, but several different scales of gloss measure-

ment. Each is used to represent the glossy appearance of a material or group of materials of somewhat similar appearance.

• RESIN BONDING AND STRENGTH DEVELOPMENT IN OFFSET PAPERS. Charles G. Weber, Merle B. Shaw, Martin J. O'Leary, Joshua K. Missimer. *Paper Industry and Paper World* 30, No. 1, April, 1948, pp. 83-88 (6 pages). A series of experimental offset papers were made in which the strength and resistance to surface pick were developed mainly by bonding the fibres with a synthetic resin instead of by the commercial beating. The papers were made from three widely different furnishes of commercial wood pulps, and the principal bonding agent was melamine-formaldehyde resin. In all instances, the resin-bonded papers were superior with respect to curling, oil absorption, folding endurance and resistance to tear than gel-bonded control papers with comparable bursting strength and resistance to pick. Expansion also was improved in sulphite-soda papers. Only small amounts of resin were required to improve greatly the strength of papers composed principally of short-fibred filler pulps.

RESINS FOR THE PAPER CONVERTER. George C. Borden, Jr. and Samuel S. Gutkin. *Technical Association of the Pulp and Paper Industry Monograph Series No. 5*, 95 pages. This monograph is essentially a catalog in which individual resins in sixteen classifications are defined and described as to physical properties and applications. The following classifications are included: Cellulose Film-Formers; Vinyl Polymers; Protein and Proteinlike Resins; Natural and Synthetic Hubber; Phenolics: Ureas; Melamines; Alkyd Resins; Polybasic Diene Acid Resins; Coumarone-Indene Resins; Polymerized Terpene Resins; Silicones; Chlorinated Diphenyls; Aryl-Sulphaonamide-Formaldehyde Resins; Natural Resins; Water-Soluble Resins.

• SODIUM CARBOXYMETHYLCELLULOSE FOR PAPERMAKING. Eleanor F. Horsey. *Paper Trade Journal 125*, No. 4, July 24, 1947, pp. 52-56 (5 pages). Carboxymethylcellulose sodium salt (CMC) has been employed in various papermaking operations. The procedures described include surface applications on paper and paperboard and internal addition at the beater at varied basis weights and freenesses. The surface treatments gave increases in resistance to the penetration of hydrophobic materials, such as oils and waxes, as well as generally improved surface properties. A surface application of carboxymethylcellulose ammonium salt gave higher resistance than CMC to the penetration of hydrophobic materials, such as oils and waxes, as well as generally improved surface properties. A surface application of carboxymethylcellulose ammonium salt gave higher resistance than CMC to the penetration of hydrophilic materials such as feather ink. Addition of CMC at the beater produced a stronger, more highly sized sheet at high freenesses, and a less opaque, less porous sheet at low freenesses. High-viscosity-type CMC of substitution 0.3 to 0.45 was used for beater addition; lower-viscosity types of CMC of substitution ca 0.75 were used for surface applications.

Coated and calendered papers

• THERMOPLASTIC COATED PAPERS. James R. Carter II. *Printing Equipment Engineer* 76, No. 1, April, 1948, pp. 33, 70, 72 (3 pages). The development of a delay-action thermoplastic eliminates the necessity for aplying heat and pressure simultaneously to label papers. Properties desirable in thermoplastic label papers are enumerated. The basic types of thermoplastics that have been developed by the Nashau Gummed and Coated Paper Company and their uses are described. These various types of adhesive formulations can be applied to any ordinary papers used in Graphic Arts industries.

CONTROL OF GLOSS IN PRINTING. Harry C. Fisher, assignor to Consolidated Water Power and Paper Company. *United States Patent No. 2,419,206* (April 22, 1947). The process for producing a coated surface on paper webs which will give a mat imprint when subsequently printed with non-aqueous base inks, which consists in applying a water wetting and penetrating agent to the surface of the web and then coating the web by printing it with a mineral coating in an aqueous vehicle and then drying the said coating. *Official Gazette* 597, No. 4, April 22, 1947, p. 502.

Paper conditioning

• CONDITIONING PAPER FOR PRESS. Charles F. King. *Inland Printer* 120, No. 4, January, 1948, pp. 51-53 (3 pages). This article, taken mainly from Lithographic Technical Foundation and Bureu of Standards Bulletins, discusses the importance of temperature (which is seldom given its due consideration) and relative humidity in conditioning paper for the offset press. The pre-conditioning should be done at the paper mills, but since most of the larger users have their own seasoning plants and do not demand it, the mills still supply paper without the proper moisture content, hence the smaller users without conditioners just blame the weather. Illustrations are given showing the behavior of paper on the press and a machine for conditioning offset papers.

• PAPER CONDITIONING. *Paper and Print* 19, No. 3, Autumn, 1946, pp. 186, 188, 190, 192, 194, 196 (6 pages). After outlining the reasons for the hygroscopicity of paper and the resulting register troubles of the printer, paper maturing marhines are described, including a large unit to be installed at the paper mill, and two smaller ones, a straight and a circular type, for printing works. There is, of course, no point in controlling the moisture content of the paper if the temperature and humidity of the pressroom remain uncontrolled. Most progressive printers have air conditioning plants installed, at least in the machine room and paper warehouse, to ensure that the atmosphere remains constant in each of these two important departments. *Bulletin of the Institute of Paper Chemistry* 17, No. 8, April, 1947, p. 423.

Paper testing

• THE PRINTING TECHNICIAN AND THE PAPER-MAKER. R. B. Fishenden. *Paper-Maker and British Paper Trade Journal* 113, No. 3, March, 1947, pp. TS 23-4 (2 pages).

Hints are given on carrying out printing tests and the difficulty of translating tests carried out on platens to cylinder machines, the physical aspects of the transfer of an ink film to paper (including ink penetration), estimating print quality, and the relation of paper properties to tone reproduction in letterpress and lithographic printing are discussed. *Printing Abstracts* 2, No. 4, April, 1947, p. 144.

PHYSICAL CHARACTERISTICS OF PAPER. Leslie G. Luker. *British Printer* 59, No. 353: 38-40 (March-April, 1947). This article deals chiefly with inexpensive methods for the physical testing of paper. Use of expensive instruments is only briefly discussed. Tests are described for determining the opacity, thickness, resistance to stretch, machine direction, ink-bearing quality, and relative absorbency of paper. Instructions are also given for differentiating genuine craft brown paper and genuine greaseproof paper from imitations. *Bulletin of the Institute of Paper Chemistry* 17, No. 11, July, 1947, p. 642.

• UNIVERSAL PAPER TROUBLES. Charles F. King. *Inland Printer* 120, No. 3, December, 1947, pp. 99-101 (3 pages). The prevention of misregister troubles is discussed. The use of the Paper Hygroscope to determine whether the paper is at the correct relative humidity to be run is useful in avoiding waviness or wrinkling of the paper due to exposing it to an atmosphere which contains either more or less moisture than the paper. Methods for correcting these troubles when they do occur are briefly reviewed. The importance of having the grain of paper paralleling the axis of the impression cylinder when registering offset plates is pointed out.

• THE ELECTRONIC GLOSS INDICATOR AS AN AID IN THE CONTROL OF PAPER FINISH. Kenneth Bowers. *Paper Trade Journal* 126, No. 15, April 8, 1948, pp. 59-60 (2 pages). The control of paper finish has long been a problem of the paper industry. This discussion deals with the method of controlling pressure and moisture conditions at the supercalender stack and pressure conditions on the friction calender stack, and describes an electronic gloss indicator that continuously indicates gloss variations of the moving paper web.

MEASUREMENT OF PRINTING SMOOTHNESS. S. M. Chapman. *Pulp and Paper Magazine of Canada* 48, No. 3, 140-50 (1947). Printing smoothness of paper is defined as the proportion of the sample area which can come in contact with a smooth surface pressed against it under a pressure comparable with printing pressures. Some theoretical objections to the use of the usual air-leak smoothness testers are discussed in connection with their use to predict printing quality. A new instrument has been developed in an attempt to measure the printing smoothness of paper as distinct from the smoothness of the free surface. The fraction of the total sample area which can touch a glass prism under pressure is taken as a measure of the printing smoothness. The softness of the material underlying the sample has a considerable effect on the result but further investigation is needed. The instrument possesses a high degree of reproducibility but only a comparatively low range of values was encountered in the paper tested (newsprint). The results correlate fairly well with printing tests made on a proof press. Bekk smoothness tests on the same papers give little or no such corre-

lation. Higher relative humidities give rise to greatly increased values of printing smoothness, presumably because of the increased compressibility at higher moisture contents. The manner in which the printing smoothness increases with pressure is shown and the variation of reflectance with pressure is indicated. Theoretical deficiencies in the present instrument are discussed and it is shown that some means must yet be found to duplicate the action of the ink film present in the printing operation. *Chemical Abstracts* 41, No. 11, June 10, 1947, p. 3624 (1 page).

• PRINTING SMOOTHNESS OF PAPER. *Paper Trade Journal* 126, No. 16, April 15, 1948, pp. 62-4 (3 pages). Test procedures are described for determining the smoothness of printing paper by three different instruments: the Bekk, the Gurley-Hill S-P-S, and the Williams.

MOISTURE DETERMINATION OF PAPER BY ELECTRICAL METHODS. D. Steenberg. *Svensk Papperstidn.*, 1946, 49 (17), 394-6 (September 15); *Bulletin of the Institute of Paper Chemistry*, 1947, 17 (6), 304 (February). The author describes briefly a number of electrical moisture meters, such as the Siemens and Trub and Tauber instruments, the Shirley and Hart moisture meters, the Moist-O-Graph of the Brown Instrument Company, the Elmometer of Kipp and Zonen, Delft, Holland, and the British instruments described by Gardiner and Amphlett. Two illustrations and six wiring diagrams are included. *Printing Abstracts* 2, No. 6, June, 1947, p. 233.

***The K.B.B. Galvanic Sizing Tester.** F. Bridge, H. Ainsworth Harrison, and A. V. Wright. *Paper Maker and British Paper Trade Journal* 113, No. 5, May, 1947, pp. TS 25-29 (5 pages), and 113, No. 6, June, 1947, pp. TS 34-36 (3 pages). Total of 8 pages. This instrument is capable of measuring either directly or by interpretation the resistence of a sheet of paper to the penetration of water. The combination of a zinc plate as the lower electrode and a porous metallic wetting pad made of sintered bronze as the upper electrode becomes a low voltage galvanic cell. Paper samples are placed between the two electrodes. The end point is the passage of a selected microamperage and the number of seconds required to reach it is recorded. Data are given showing results obtained with nine different papers using end points of 1, 2, 4, 6, 8, 10, 20, 30, 40, and 50 microamps. The effects of pinholes, relative humidity of the paper, water temperature, and electrolytes in the water or paper were investigated. Tests were made to correlate results with those obtained by the Tappi Dry Indicator method. Reproductibility data with one instrument over a period of time, and with seven different instruments are given.

***INVESTIGATIONS OF SPOTS ON IMPRESSIONS.** A. G. Hope. ***Paper and Print* 20, No. 2, Summer, 1947, pp. 114, 116 (2 pages). The three main causes of spots appearing on impressions are, namely, dried ink specks, falling paper dust, and minute holes in the surface of the paper. The use of a magnifying glass and a micrometer to detect and identify the nature of the spots is discussed. Suggestions are given for preventing much of this trouble.**

Lithographic inks—general

The Chemistry and Physics of Organic Pigments. L. S. Pratt. Book published by John Wiley & Sons, Inc., 1947, 359 pp., $6.00. This is a text

book for which need has long existed. Exact information on the chemical structure, properties and methods of identification of organic pigments has been difficult for the consumer to obtain.

PRINTING INKS. O. A. Guinau. *Chim. Peint.* 1947, 4 (3), 137-9; (5), 188-93; (6), 225-30; (7), 259-62; (8), 300-7; (10), 399-402; 1942, 5 (4), 127-31; (6), 201; (8), 280-8; 1943, 6 (3), 94-9; *Rev. Paint. Col., Varnish and Allied Ind.*, 1947, No. 119, 333 (Sept-Oct). A review dealing first with the general properties required of printing inks and then in more detail with the letterpress, offset and photogravure processes, with the reproduction of illustrations, and with colored printing inks. Neugebauer's theory of 3-color printing is explained in detail and simple methods, based on this theory, are described for testing the suitability (as regards color) of 3-color inks. *Printing Abstracts* 3, No. 2, February, 1948, p. 45.

• PAINTS AND PRINTING INKS. *Paint* 28, No. 3, March, 1948, pp. 93-95 (3 pages). A paper presented by W. E. Wornum to the Oil and Color Chemists' Association in London is reviewed. A general discussion is given of the differences between paints and printing inks and a comparison is made of the use of materials common to both industries. It is pointed out that paints are largely for protective purposes and have to withstand exposure, while inks are largely decorative and, where exposure is called for, are usually protected by a film of lacquer. Consequently since there is a difference in their end usage, there are also differences in the methods of application, in the formulation, and in the properties required for paints and inks. The requirements of inks for letterpress, lithography, and gravure are described. Tack is discussed as it affects both inks and paints.

• INK DIFFICULTIES AND HOW TO CURE THEM. Rusell J. Hogan. *American Printer* 125, No. 6, December, 1947, pp. 136-7, 144, 146, 149, 150 (6 pages). Forty-four ink difficulties are listed. The identity and method of detection, the possible cause, and the possible remedy for each are discussed briefly.

• NEW DEVELOPMENTS IN PRINTING INKS. Lance Coates (talk before foremen at Brown & Bibby, Ltd.) *British and Colonial Printer* 141, No. 978, August 1, 1947, pp. 65, 74 (2 pages). Innovations required by the use of rotary presses include a new type of ink, new equipment to dry the ink at speed, a new kind of paper, new rollers, and perhaps new platemaking techniques. New developments with regard to drying of inks include the instantaneous drying of ink by heat in web-fed printing, and a new type of ink, without oil, which dries in a matter of minutes upon touching paper. The Hausleiter, Aller, Coates, and Alkuprint bi-metallic plates are mentioned. The printing image is on top of the water-retaining surface on all of these but the Coates plate. The Coates plate is a deep-etch plate where the image is in intaglio, underneath the chromium water-receptive surface. The advantages of this plate are listed. A new synthetic resin and oil composition for rollers and an emulsion type of ink which supplies the moisture for the plate instead of its being supplied by a water duct are discussed.

• THE NEW PLASTIC FILMS AND LITHOGRAPHY. *Modern Lithography* 15, No. 8, August, 1947,

pp. 28-29, 85 (3 pages). A different principle is involved in printing on plastic films than that dealt with in printing on paper or metal. The inks used in printing on a plastic film contain a binder of the same general type of resin as the film. The ink also contains a volatile solvent which softens the film so that the pigmented binder becomes welded to it. When the surface dries, the ink becomes a part of the film and has the same resistance characteristics as the film. Discussed are new films, namely polyethylene, ethyl cellulose, the vinyls, Pliofilm, Saran, and the polyvinyl alcohols, their uses, problems conected with printing on them, and the kind of printing that has been done of them to date.

***Printing Inks for Plastics.** *American Ink Maker* 25, No. 9, September, 1947, pp. 52-4, 110 (4 pages). This article is a review of the newer plastic sheet materials, their characteristics, and methods of printing on them. The fact that in most cases an active solvent must be incorporated in the ink is pointed out.

"Wink-Dri": The New No-Smudge Printing Ink. J. R. Rued. *American Paper Converter*, 1947, 21 (6) 21. Wink-dri is a fast drying, no-smudge printing ink, based on a cyclized rubber resin petroleum solvent and pigment and having flow, tack, distribution and color strength. Because the drying occurs in the rapid separation of the high boiling petroleum solvent, a practically odorless substance, the speed of drying is governed by the surface absorbency of the stock. Coated M/F and similar stocks are extremely rapid, requiring one or two seconds as compared to the relatively slow drying on bond on which it dries in 10 to 15 minutes. While these inks are only suitable for letterpress printing at present, it is possible, when a non-absorbent roller and blanket is produced for the offset press, that the inks may be adapted to this process, giving almost instant drying and thus eliminating one great difficulty in the lithographic field. The porous rubber rollers and blankets used in offset printing today aid the ink in drying on the press. In letterpress printing the composition rollers and metal type are non-absorbent, allowing the ink to stay wet on the press for over 24 hours, yet drying in a second or so when printed on paper. *Printing Abstracts* 2, No. 9, September, 1947, p. 351.

Ink materials and structures

***Modern Printing Ink Vehicles. Herbert J. Wolfe.** *American Ink Maker* 25, No. 9, September, 1947, pp. 55, 57, 59, 61, 99 (5 pages). The author describes the major printing processes and the characteristics of inks required by them, the various methods by which the inks dry, and the newer developments in ink vehicles designed to promote rapid drying.

Drying oils

DRYING ACCELERATORS. *Paint* 18, No. 4, April, 1948, p. 146. Although the addition of the organic salts of lead, manganese and cobalt to accelerate the drying of oleoresinous coating compositions is well known, there are some few cases, such as in certain alkyds, where these driers are not sufficiently effective. The incorporation of an alpha-beta-unsaturated ketone in coatings made from oil-modified alkyds or unsaturated oils reduces the drying time considerably—by as much as 50% in baking compositions and toan even greater extent in air-drying compositions. If drying is carried out at room temperature,

small amounts of the usual drying metals should be added as well. Suitable ketones are mesityl oxide isophorone, methylvinyl ketone and cyclohexanone.

Ink testing and control

***Dielectrics and Rheology of Non-Aqueous Dispersions. Andries Voet. *Journal of Physical and Colloid Chemistry* 51, No. 5, September, 1947, pp. 1037-1063 (27 pages).**

*** DIELECTRICS AND RHEOLOGY OF NON-AQUEOUS SUSPENSIONS. Andries Voet. *American Ink Maker* 25, No. 12, December, 1947, pp. 34, 41 (2 pages). The present investigation of suspensions of finely divided materials in liquid media is characterized by feasuring dielectric changes simultaneously with rheological data. Practical applications of the dielectric method include identification of carbon black of any type in a specific vehicle at a specific concentration; estimation, in a few minutes, of the concentration of a known carbon black in a dispersion of a vehicle of known dielectric constant; and determination of the degree of dispersion of incompletely dispersed blacks. This method of measuring dielectrical and rheological properties simultaneously has its application in other fields, such as with high polymeric or high-molecular liquids or solutions of high-molecular substances.**

*** WHY ALKYDS IN PRINTING INKS? H. F. Payne, L. E. Cadwell, R. H. Brailey, and A. F. Schmutzler. *American Ink Maker* 26, No. 1, January, 1948, pp. 28-9, 31, 33, 35 (5 pages). Tests made show the distinct advantages of alkyds in printing inks. In addition to drying much faster, the ink films made with alkyd resins were extremely tough with excellent adhesion to the paper even when fairly thick, and have better gloss. The use of the Green rotational viscometer in measuring the difference between inks during storage and actual use is described. Tables are given showing the working properties of the inks and the rheological data (plastic viscosity, yield value, and thixotropy).**

WET FILM THICKNESS GAGE. *Instruments* 21, No. 3, March, 1948, p. 224. New "Interchemical Direct-Reading Wet Film Thickness Gage" is said to be a radically new instrument for measuring the wet film thickness of paint, varnish, lacquers and related products. It is essentially an eccentric center wheel supported by two concentric wheels. Portions influencing accuracy are machined to 0.001". Instrument measures wet film thickness within a range from 0 to 4 mils with an accuracy of 0.1 mil by simply holding axle of gage between thumb and forefinger, rolling gage over wet film, and reading calibrated engraved scale on side of outer wheel. Speed and accuracy are said to be combined. Manufactured by Henry A. Gardner Laboratory, Inc., 4723 Elm Street, Bethesda 14, Maryland.

***An Improved Tackiness Meter. Joseph M. Lambert and Richard A. McDonald. *Review of Scientific Instruments* 19, No. 2, February, 1948, pp. 119-120 (2 pages). An instrument for measuring the "tackiness" of rubber and other elastomers is described A Toledo Postal Scale which has been modified so that when the scale is pre-loaded, contact pressure and separating force can be read directly, and a Barber-Colman, Model OYAZ-439, reversible, geared-head motor, geared down to 19.5 inches per minute, are used. Three manually**

operated switches allow the sample to be held in contact for extended periods of time. Screw adjustment is provided to raise or lower pair of micro switches so that any desired contact pressure up to 20 ounces may be obtained.

CAN MOBILOMETER. *American Ink Maker* 25, No. 3, March, 1947, p. 41. An instrument which will determine the mobility or viscosity of various industrial products in their original containers of sizes ranging from one-half pint to one-half gallon is manufactured by Henry A. Gardner Laboratory, Inc., Bethseda, Maryland. It consists essentially of a cylinder supported by a bracket, a vertical support which moves this unit in a vertical reciprocal direction by means of a rack and pinion drive, a moving system, a piston guide and a broad base plate. The instrument will determine the viscosity of paints, varnishes, coatings and thin-bodied printing inks.

INK FILM DYNAMOMETER. *Paper Industry and Paper World* 29, No. 2, May, 1947, p. 282 (1 page). Thwing-Albert Instrument Company, Penn Street and Pulaski Avenue, Philadelphia 44, Pennsylvania has anounced the development of an instrument for measuring the tack of ink while the ink is in a state of agitation comparable to that which takes place in the various printing processes. Designated as the new C-46 Inkometer, the original Inkometer having been developed by the Lithographic Technical Foundation, this instrument in operation simulates press speeds. At positive settings, the three-speed transmission produces speeds of 400, 1200, and 2000 rpm. or peripheral speeds of 314, 942, and 1570 fpm. The operation of this instrument is briefly described.

Paper and ink relationships

Spectrophotometric Evaluation of the Color of Ink Marks on Paper. *Industrial and Engineering Chemistry, Analytical Edition* 19, No. 12, December, 1947, pp. 1020-2 (3 pages). A spectrophotometric procedure has been developed for evaluating the color of marks made on white paper by several types of ink. Data are presented on the colors resulting when inks of a wide range of color are applied to a definite kind of paper in specified concentrations. Specifications may be given in terms of tristimulus values, trichromatic coefficients for the graphical plotting of chromaticity, and dominant wave length, luminance, and purity. 12 references. *Bulletin of the Institute of Paper Chemistry* 18, No. 5, January, 1948, p. 317.

INK CONSUMPTION AND PRINTING QUALITY OF ILLUSTRATED PRINTING. J. Bekk. *Textil-Rundschau* 1, No. 3:75-8 (September, 1946) (In German). The author describes two laboratory procedures for evaluating the relative printing quality of different inks on the same paper and of the same ink on different papers. One procedure consists in evaluating the "blackness" of solid blacks. The second procedure is a relative evaluation of the quality of tone reproduction. *Bulletin of the Institute of Paper Chemistry* 17, No. 12, August, 1947, pp. 717-8.

• CONTROLS OF VARIABLES IN OFFSET. Karl Davis Robinson. *American Printer* 126, No. 3, March, 1948, pp. 53-54 (2 pages). Throughout the entire lithographic process chemical, physical, and mechanical reactions are being dealt with. Procedures should be standardized so that these reactions occur the same way each time and variables are eliminated, resulting in higher quality at lower cost. No other single step can do more to eliminate these variables in all departments than installation of air conditioning. Densitometric control is also essential for controlling or eliminating variables.

•Offset's Greatest Handicap. *American Pressman* 58, No. 3, February, 1948, pp. 30, 32 (2 pages). Production variation and quality variation in the offset process, as compared with other reproduction processes, are discussed. It is pointed out that, although there is room for improvement in all factors entering into the production of offset printing, the greatest handicap to offset printing is the variables entering into offset platemaking.

• THREE BASIC PRINCIPLES OF LITHOGRAPHY. Henry A. Beechem. *Modern Lithography* 15, No. 5, May, 1947, pp. 67, 69 (2 pages). The three fundamental principles upon which lithographic printing depends are: the attraction of metals for fatty substances such as oils and greases; the mutual repellency of oils and water; and the ability of some chemicals to sensitize or desensitize metals toward or against fatty substances. The application of these principles to lithography is discussed.

• DIRECTION OF PROGRESS IN PRINTING. Fred W. Hoch. *American Printer* 125, No. 6, December, 1947, pp. 103-9, 156, 158, 162, 165, 174 (12 pages). Progress in the printing industry in 1947 is discussed under the classifications: new principles in printing, improvements in existing methods, general efforts to speed up production. Brief digests are given of each 1947 development in the following groups: composing room, presses, other pressroom equipment, bindery, platemaking, photo-mechanical developments, inks, papers, motors, and miscellaneous.

Printing on Vinyl Film. Chester M. Robbins. "Textile Colorist and Converter" 68, No. 11, pp. 16-18, 40, 44 (1916). Cast or calendered films of vinyl chloride - vinylidene chloride copolymers are generally printed by depositing on the film a pigment dispersion containing a vinyl resin with a ketone solvent as a dispersing medium. In another method, a special paper is coated with an alkyd resin and then printed with a design, after which the vinyl film is cast on the paper. After the vinyl film dries, it is stripped off, taking the design with it. "Chemical Abstracts" 41, No. 10, May 20, 1947, p. 3318.

• ANALYSIS OF SPRAY MATERIALS. *American Pressman* 57, No. 10, September, 1947, p. 12 (1 page). The Graphic Arts Spray Manufacturers are listed. This group, under supervision of the International Printing Pressmen and Assistants' Union of North America and New York Employing Printers Association, Inc., submit "run of the mill" samples of their materials to New York Testing Laboratories, Inc. periodically to be analyzed to assure that the materials are free of hazards to health when used in non-offset spray devices. Standards set up by the Industrial Health Section of Metropolitan Life Insurance Company by which these materials are judged require that any

dextrines, glucose, starches or other vegetable or fruit solids should be of edible grades; any gum arabic used should be of U.S.P. quality, any talcs or other solids not of vegetable or fruit origin should be of U.S.P. quality and free from grit and sand; and any denatured alcohol used should carry the manufacturer's guarantee that it does not contain wood alcohol or other harmful denaturing element. When materials measure up to these standards they can be marked with the Graphic Arts Spray Manufacturers' "Approved" label.

Technical discussions

***Litho Clubs Elect Tucker: Add Executive Secretary.** *Modern Lithography* **16, No. 2, February, 1948, pp. 35, 36, 61 (3 pages). The National Association of Litho Clubs held its third annual convention in the Congress Hotel, Chicago, January 24. The work of the LTF was among the topics of discussion, and audio-visual equipment developed at Glessner House for use in spreading knowledge of Lithographic Technical Foundation findings was demonstrated. Open house was held at Glessner House during the convention, and a series of demonstrations was given of tests and research work in progress for 152 visitors.**

• BIGGEST NAPL CONVENTION. Fred J. Huntley and Sam A. Cousley. *Printing* 71, No. 11, November, 1947, pp. 56-64 (9 pages). The activities of the NAPL Convention held in Detroit, October 22-25 are reviewed. Labor relations, photo-composing, graining, magenta masking, the Fotosetter, register problems, proper pH values, and characteristics of good offset paper were but a few of the topics discussed.

Lithographic research

• RESEARCH IS AN INVESTMENT. Ernest E. Jones. *Modern Lithography* 15, No. 9, September, 1947, pp. 53, 54, 59, 91, 93, 95 (6 pages). The importance of research in the lithographic industry is pointed out. The benefits derived by the industry from the Lithographic Technical Foundation are stressed. The program of the Foundation, its organization and staff, and its need for support are discussed.

• RESEARCH IS AN INVESTMENT. Ernest E. Jones. *National Lithographer* 54, No. 10, October, 1947, pp. 38, 94, 96, 100 (4 pages). The latest developments in research plans and activities of the Lithographic Technical Foundation are reviewed. Mr. Jones explains the functions and operation of the LTF, and the necessity for all lithographers and those in related trades to support and cooperate with it.

Lithographic Technical Foundation

***LTF Now Directs Own Research at Glessner House, Chicago.** *Printing* **71, No. 10, October, 1947, pp. 95, 98 (2 pages). The new organization and research program of the Lithographic Technical Foundation, effective September 1, are described. The accomplishments of the Lithographic Technical Foundation while working with Armour Research Foundation, the advantages of now conducting its own research program, and the equipment and staff available to carry on the proposed program are reviewed briefly.**

• LITHO TECHNICIANS DESCRIBE LTF RESEARCH DISCOVERIES. *Printing* **71, No. 12, December,**

1947, pp. 87, 91 (2 pages); *Modern Lithography* 15, No. 12, December, 1947, pp. 69, 104-5 (3 pages). Work and results on the following research projects of the Lithographic Technical Foundation were described by LTF technicians at the recent LTF Committee Meeting in Detroit: plate desensitization and the development of cellulose gum, graining standardization, sensitivity of plate coatings, and tone reproduction. Continuation of these projects and of the studies of possible blanket improvement; the undertaking of new projects on bi-metallic plates, and plate storage; and the posible development of new photo-sensitive materials are on the program for 1948. Publication of new technical and research bulletins is also scheduled, as well as continued bimonthly issuance of *Research Progress* and *News Letter*.

• THE LITHOGRAPHIC TECHNICAL FOUNDATION. *Harris Impressions* 8, No. 1, January-February, 1948, pp. 1, 4 (2 pages). The achievements of the Lithographic Technical Foundation since its organization twenty-three years ago, and the benefits offered to each member by it are discussed briefly.

V. GRAPHIC ARTS—GENERAL

• FILMS RELATING TO THE GRAPHIC ARTS. *American Printer* 125, No. 6, December, 1947, pp. 134-5, 153 (3 pages). A list is given of films, both silent and with sound, which have been made on graphic arts subjects, and which are available for the use of clubs, schools, and other groups interested in graphic arts. The scope of each film is briefly described, the producer is named, and information is given on rental conditions and other details.

• THE GRAPHIC ARTS IN EUROPE. Henry P. Korn. *Modern Lithography* 15, No. 9, September, 1947, pp. 42, 87, 89, 91 (4 pages). This article discusses the graphic arts situation as it is in England, France, Italy, Switzerland, and Belgium. In England, offset printing is playing a bigger part. Reproduction departments work with gallery cameras and use darkroom types for only large reproductions. Cameras are built to operate more automatically and are made mostly of metal. Little time has been devoted to new developments in Europe with the exception of bi-metallic plates, the most important ones being the Hausleiter, Aller, Ålkuprint, and Coates plates. In France considerable work is being done in the fine print trade in gravure, offset and screenless offset. In Switzerland great progress has been made in the use of plastic sheets for blue line work. All of Europe's plants are in dire need of paper, supplies, and machines.

• POSITIONING AND ARRANGEMENT. E. A. Kilheffer. *American Pressman* 57, No. 10, September, 1947, pp. 35-39 (5 pages). The positioning and arranging designs, pages, or units for label, container or novelty printing are discussed. The amount of stock required for individual label, package, box or other piece of printing must be determined, the position of the design on this stock decided upon, then an

arrangement of multiple units on the sheet and press worked out to use the least amount of paper and obtain the highest possible production at the lowest cost. Illustrations and instructions are given for possible arrangements of a number of different type labels. Some of the numerous factors involved in sheet layouts are discussed.

FLUORESCENT LIGHTING AND HEALTH. General Electric Ltd. *London Typographical Journal*, 1947, 42 (494) p. 9 (February). Fluorescent lighting is not harmful to the eyes. Complaints of conjunctivitis being caused by it were investigated and it was found that the trouble was due to too little lighting. *Printing Abstracts* 2, No. 4, April, 1947, p. 169.

Technical processes

*The Photogelatine Process. *Printed Selling, November*, 1947, pp. 11-14 (4 pages). A brief resume of the photogelatine process is given. The process is adapted to run up to 5,000 impressions, and is particularly suited where a large number and large-sized illustrations are to be produced.

THE USES OF COLLOTYPE IN POSTER PRODUCTION. R. G. Martin. *Advertiser's Weekly*, 1947, 135 (1,761), 385-6 (March 6). Collotype on its own is not a practical proposition, but used in conjunction with one of the other available processes, and specifically with photo-offset lithography, it can be a real asset. An outline is given of the production of the printing plate. *Printing Abstracts* 2, No. 5, May, 1947, p. 201.

*OFFSET PRESS CAN'T MATCH SPEED AND VOLUME OF THE ROTARY LETTERPRESS. Eugene St. John. *Inland Printer* 119, No. 4, July, 1947, pp. 37, 38 (2 pages). Some of the statements made in the folder published by the Cleveland Lithographic School, titled "Where Should I Use Lithography" are refuted. This folder gives a detailed comparison of the letterpress and offset processes. For volume letterpress far excels the offset process. On the other hand, offset does cost less for work run in commercial shops of medium volume, especially when the job is to be mostly pictures. However, although engraved plates cost more, they wear better and last longer. The letterpress process is also more dependable than offset. It is pointed out too that for greatest detail strength and color brilliance, coated paper is essential, and while the letterpressmen can print on this coated paper without difficulty, it often causes troubles for the offset pressmen. It is concluded that both offset and letterpress have advantages, and should both be utilized in the plant, offset for work that is mostly pictures and on uncoated papers, and letterpress for big specialty jobs.

• STILL A LABORATORY BABY. R. R. Schaffert. *Printing Equipment Engineer* 75, No. 2, November, 1947, p. 17 (1 page). A method is described for transferring an image directly to a metal plate without the use of photographic film. The metal plate is coated with a special coating, and then sensitized by spraying with electrons. The plate is then exposed in the camera. The photographic speeds are comparable. A "micronized" powder is dusted on the plate to develop the image, and the powder is burned in. The process produces a positive to positive image. The process is still in the experimental stage at Battelle Memorial Institute.

***Platemaking Without Film.** Dr. R. R. Schaffert. *Share Your Knowledge Review* xxix, No. 5, February, 1948, pp. 33 & 34 (2 pages). A description of a method of producing a positive image in the camera directly on a metal printing plate. The plate is coated with a special coating, then given a charge of static electricity. It is then given a short exposure comparable to that used with a photographic emulsion. The plate is then dusted with a special micronized powder, which adheres only to the image areas. The final step is the burning in of the powder. The process, still in the laboratory stage, was developed at Battelle Memorial Institute, Columbus, Ohio.

• PHOTO-ENGRAVING BEING DONE ON MAGNESIUM. H. E. Swayze. *Photo-Engravers Bulletin* 37, No. 4, November, 1947, pp. 154-162 (9 pages). A discussion of the production of photo-engraved magnesium alloy printing plates for letterpress work. This process was developed at the Leesburg Commercial Ledger, Ocala, Florida, and announced July 19, 1947. Copy is prepared, pasted onto a master page board and photographed. Pictures are photographed separately and then stripped in. The entire page negative is then printed onto a sensitized sheet of magnesium photo-engraving alloy. An 18" x 22" x .064" sheet weighs only 1.6 lb. compared to 6.4 lbs. for zinc. A 7% nitric acid bath is used for etching, which is a weaker solution than is used for etching zinc plates. Advantages claimed for the process are lightness of the plates, possibility of increased press speed, low cost reproduction, increased use of pictures, excellent reproduction of pictures, and elimination of typesetting machines and stereotyping operations. The magnesium wears less than electrotypes, curves well on the press, machines with less difficulty than type metal, and can be chromium plated for long runs.

• DETERGENTS. M. S. Kantrowitz and E. J. Gosnell. *Printing Equipment Engineer* 74, No. 2, May, 1947, pp. 15-17 (3 pages). In an investigation by the Government Printing Office on types of detergents used in removing ink or grease from the printing surface, removing wax from electrotype shells, cleaning of press rollers, and similar operations, the two types of detergents commonly used are volatile solvents and alkali cleaning agents. A third type, known as surface active or wetting agents, has found only limited use as a detergent because of its relatively high cost. This article recommends certain detergents for specific purposes as a result of this investigation.

***Photomicrographic Analysis of Halftone Printing.** I. M. Bernstein. *Modern Lithography* 15, No. 10, October, 1947, pp. 46-49, 137, 139 (6 pages). A comparison of halftone dots printed by letterpress, offset and gravure, as studied by the National Printing Ink Research Institute. Photomicrographs are shown to illustrate the basic factors of dot contour and density or coverage that determine the qualities of halftones. Also see *American Ink Maker* 25, No. 9, September, 1947, pp. 48-51, 93 (5 pages).

TRANSFERS. F. W. Burgess, S. C. Prior, and Trapinex, Ltd. *British Patent No. 564,296* (August 24, 1943). A double-sided transfer is made by printing or otherwise forming display matter in reverse on two gummed sheets of paper, and then joining the sheets together by a waterproof adhesive, such as shellac varnish, with the paper outer-

most. The display matter may be of paint, and the transfer may be applied to transparent surface to be viewed from opposite sides, or to an opaque surface so that one or other side of the transfer is visible. *Abridgement of Specifications, British Patent Office,* Group XVI, Section 560,001-580,000, p. 43.

MOLD AND MILDEW CONTROL. S. S. Block. *Bulletin 12,* November, 1946, *Florida Engineering and Industrial Experiment Station,* University of Florida, Gainesville, Florida, 50 pp. This bulletin covers the following: methods of mold control, protection of fabrics from microbial action, removal of mildew stains from fabrics, how to prevent mildew on paint, preservation of leather from mold attack, wood preservation, mildew on books, and mold control in bakeries.

Air conditioning

***WHAT ABOUT AIR CONDITIONING? Charles F. King. *Inland Printer* 119, No. 4, July, 1947, pp. 38-41 (3 pages). It is pointed out that the value of air conditioning is usually questioned only by those who have either installed an incomplete system or who do not have a cost system set up that shows just how great their savings are. The plants which made a careful study of the problem prior to purchasing the air conditioning equipment feel that the expense of installation and maintenance are minor when compared with actual savings. It is suggested that before installing air conditioning, a thorough investigation be made of the cost and effectiveness of the various types of equipment available which are capable of maintaining constant conditions of temperature and relative humidity regardless of outside conditions, as well as the savings that may be expected from the installation of this equipment. Points which should be kept in mind during this investigation are discussed.**

AIR CONDITIONING APPARATUS. Agnew H. Bahnson, Jr. *United States Patent No. 2,440,627* (April 27, 1948). Air conditioning apparatus which comprises: a duct having an inlet for air to be humidified and an outlet for discharging humidified air to a space to be humidified; air circulating means including a fan mounted in the duct and a motor for driving said fan; air humidifying means mounted in said duct; temperature controlled means for lowering and raising the speed of said fan in response to lower and higher temperatures respectively in the space to be humidified; and means responsive to a decrease in space humidity for increasing the speed of said fan above that established by said temperature-controlled means for a relatively low temperature within the space to be humidified. *Official Gazette* 609, No. 4, April 27, 1948, pp. 901-2 (2 pages).

Unit Humidifier. "Canadian Printer and Publisher" 56, No. 5, May, 1947, p. 44 (1 page). A small humidifying unit which may be of use to small or medium size printers and publishers, particularly for paper storage, is the Unit Humidifier manufactured by Supreme Electric Products, Rochester, New York. The Unit Humidifier features a spray tube, four inches in diameter by 21 inches in length, suspended from the ceiling, with an atomizing, self-cleaning spray nozzle, hand-operated damper to control the volume of vapor, an overflow for free moisture and necessary connections with available water supply. Thirty-pound pressure minimum is essential.

HUMIDIFYING. *Industrial Equipment News* 16, No. 3, March, 1948, p. 72. The new motor-operated Walton industrial humidifier delivers vaporized water at the rate of 1 gph. It suspends from overhead, connects through a humidistat and line switch to start and stop its operating motor in step with moisture variation in the surrounding air. Air is drawn in through a glass-fibre filter. The assembly measures 18 inches in dimeter, 14 inches in height, weighs 60 pounds. It connects to a ½-inch water line and to a source for 110-volt 60-cycle ac. Input is about 100 watts. May be secured from Abbeon Supply Company, 58-12 41st Drive, Woodside, New York. List price is $195 without the control to operate on ac. $215 for dc. Control equipment adds $35, one being suitable for a maximum of four units.

Adhesives

Revised Method of Conducting Ply Adhesion Tests. H. H. Faupel. "Publication Board Report L 67512. February, 1943. 18 p. Price: Microfilm—$1.00; Photostat—$2.00. A modification of the standard ply adhesion test has been developed whereby a graphic record of the resistance to separation is obtained. By this graphic record the adhesive quality and adhesive strength of materials such as coated fabrics, rubberized materials and adhesives, are more accurately determined. Photograph, drawing and graphs are included. "Bibliography of Scientific and Industrial Reports" 5, No. 6, May 9, 1947, p. 494.

The Identification of Adhesives. F. D. Armitage and M. J. Curran. "Packaging Technical Paper," No. 2, 1946, 27 pp. (E17/2). This paper presents a scheme for the identification of adhesives in the form of a died out film. The adhesives which come within the scope of the scheme are those in which water is the main solvent (excluding synthetic resin and rubber emulsions.) Tests can be carried out by anyone with a minimum of chemical training. Tests for sizing materials, mineral loading and coating materials are included. "Printing Abstracts" 2, No. 4, April, 1947, p. 170.★★

Technical developments in Germany

GOVERNMENT REPORT COVERS SEVERAL GERMAN PROCESSES. *Printing* 70, No. 9, December, 1946, p. 58. PB Report No. 34044 on bimetallic printing plates developed by the Germans is reviewed briefly. Other developments described in the report include: recent advances in the "Eggen" and "efha" process for deep etching of lithographic plates; light spacing furniture, made by injection molding; high treatment of a cellulose varnish to produce a high finish on show cards; bookbinding techniques, including wire book-sewing machines; printing machines producing up to four colors on one side; "Aktophot" projection camera and other photocopying apparatus; manufacture of gravure inks with a water base; use of "Astrolon," a celluloid-like vinyl chloride sheet, for measuring scales, rulers and protractors, as well as bases for originals in photolithography; Klimsch "Stator" machine, claimed to be economical for applying an even emulsion coating to photo-sensitive plates; a dry collodion process for three or four-color separations. This report is available from the Office of Technical Services, Department of Commerce, Washington 25, D. C.

RESEARCH IN THE GERMAN PRINTING INDUSTRY. M. Brown and J. A. S. Morrison. *B.I.O.S.Final Report No. 1255,* London; H.M.S.O. 1947, ii. 18 pp. 2s.6d (Di.111/1255). The following targets were investigated; (1) the research work carried out by Dr. Albrecht, formerly of the Forschungsinstitut fur das graphische Gewerbe, Berlin-Charlottenburg, into plastic type and printers' furniture, water-base gravure inks, testing the set-off of gravure inks, the testing of mercury vapour and fluorescent lamps for printing-down carbon tissue, and the use of polyvinyl alcohol as a substitute for gum arabic in litho plates (diazo-polyvinyl alcohol and dichromated polyvinyl alcohol); (2) the development of plastic type and printers' furniture by Dr. Strunk, of the Deutsche Verlag, at Sintegra G.m.b.H.; (3) the use of an acetone lamp black lacquer for spraying type form, for photographing to give an original for reproduction by photolitho; (4) the Hausleiter bimetallic plate. *Printing Abstracts* 2, No. 11, November, 1947, p. 490.

Printing Process Used by Wehrmacht. M. F. T. Falkner and W. B. Hislop. *B.I.O.S. Report No. 568.* A printing process invented by Groyen, of Kind Jr. A.-G. process engravers, in Germany, is described. It is reported that the process was used in Germany during the war for rapid distribution of air-survey photographs, etc.★★

REPORT ON DIAZO PROCESSES DEVELOPED BY KALLE UND CO, A. G. Paul W. Dorst. Publication Board Report No. 27127 "Photo-Mapping and Map Reproduction" C-4. Several new light-sensitive diazo preparations and processes using them which have been developed by Kalle und Co., A-G. are described briefly. Unique among these preparations is a diazo compound which serves as a substitute for ammonium bichromate. This compound is the basis for coating solutions used in making positive and negative transparencies, and in making photolith plates from both positives and negatives. A "foil" for making continuous-tone diazo prints, and a simple method of making good Ozalid prints from tracings having weak pencil lines, are also described.

PHOTOMAPPING AND MAP REPRODUCTION. *J.I.O.A. Report No. 13: P. B. Report No. 4116.* This is a collection of reports made of interviews with German personnel. 1. *Lithographic Techniques* developed by F. H. Hausleiter. (a) A so-called Steel Plate is a bimetal lithographic plate, having an unusually long life, for printing bank notes. (b) The F.O.S. process, known in the United States as the "film without a layer (FWL)," produces a positive transparency reading from right to left, from a transparency reading from left to right. (c) Hausleiter has developed and sold a silver-gelatin emulsion for lithographic use. Marketed in lumps, it must be soaked and warmed before coating on plates. (d) A method has been developed for electroplating a copper binding around the edge of glass halftone screens. (e) A claim is made for a black dye which produces a great density in thin gelatin layers for relief processes. 2. *Equipment and Technique Examined at Steinheil and Sohne* included: (a) three methods for producing nonreflecting coatings on optical surfaces: vacuum, centrifuge, and chemical; (b) partially reflecting mirrors; (c) protective coatings for first-surface mirrors; (d) a method of growing optical crystals of sodium chloride

and lithium fluoride; and (e) a 9-in. aerial mapping camera. One photograph is taken vertically and eight others obliquely, all images being recorded on film. A rectifier has been developed for use with the images. 3. *Methods and Facilities for the Manufacture of Halftone and Gravure Screens.* The general technique of making halftone screens is essentially the same in all six plants in the world, three of which are in Germany. 4. *Diazo Processes Developed by Kalle and Co., A.G.* (a) A diazo compound which may be used on lithographic plates is described. (b) Ozalid negative foil gives a continuous-tone red negative image. (c) Aluna film has been developed for use in making Ozalid prints from existing prints. The film is a silver emulsion coated on a film base or transparent paper, and is exposed by transmitted light or by the reflex method. 5 and 6. *Litho Press Trailers and Offset Press Design.* 7. *Recent Lithographic Processes in Germany.* To a limited extent, aluminum plates coated with an oxide film produced electrolytically have been used for Rotaprint presses. Deep-etch plates have been most popular recently for commercial work and map reproduction. The Beka process is considered obsolete. Hausleiter has developed a deep-etch plate process that uses no alcohol. His steel plate has been used to an important but limited extent. Diazo materials have been used slightly. Press plates for printing posters have been made by direct projection on metal coated with silver gelatin. Offset presses have been in wide use and direct lithographic presses have been more in use than in the United States. *Monthly Abstract Bulletin* 33, No. 11, November, 1947, p. 448.

GERMAN PROCESS SCREEN INDUSTRY. R. D. Cooper. *PB Report 81091,* September-October, 1946, 11 pages. Price: Microfilm, $1.00; Photostat, $1.00. Four plants were visited and an individual report given on each plant describing machinery used, types of screens produced and methods used in producing them. Source of glass, present stocks and present activities are also discussed. *Bibliography of Scientific and Industrial Reports* 8, No. 2, January 9, 1948, p. 131.

LITHOGRAPHED IN U. S. A.

Foundation Publications

SKILLED CRAFT TEXTS

Lithographic Offset Press Operating, Volume I
Lithographic Offset Press Operating, Volume II
Offset Press Troubles
Press Technical for Offset Lithography
Offset Platemaking (Albumin)
Offset Platemaking (Deep Etch Gum Process)
Offset Platemaking—Advanced
Offset Photography—(Line)
Offset Photography (Halftone)
Offset Photography (Color Separation)
Tone and Color Correcting (Opaquing)
Tone and Color Correcting (Hand Retouching)
Tone and Color Correcting (Dot Etching)
Offset Stripping (Black and White)
Offset Stripping (Color)

SPECIAL SUBJECT TEXTS

Chemistry for Lithographers I
Chemistry for Lithographers II
Survey of Lithography
Estimating (Black and White)
Estimating (Color)
Leadership Training

SHOP MANUALS

Paper and Humidity in the Pressroom
Dot Etching
Albumin Platemaking
pH Control of Fountain Solutions
Inking System for the Offset Press
Lithographic Offset Press Blankets
Feeder and Delivery for Offset Presses
The Dampening System of Offset Press
Guides, Grippers and Insertion Devices
Graining of Lithographic Plates
Offset Plates in the Pressroom
Offset Photography (Line)
Inks for Offset Lithography
Packing and Pressures for Presses
Press Cylinders for Offset Lithography
Offset Photography (Color Separation)
Hand Transfers for Offset Lithography

Press Troubles for Offset Lithography
Gauges and Instruments for Offset
Photo-Composing for Offset Lithography
Tone and Color Correcting (Retouching)
Proving for Offset Lithography
Platemaking for Offset (Deep Etch)
Offset Photography (Halftone)
Paper for Offset Lithography
Paper Conditioning for Offset Lithography
Plate Troubles in Offset Lithography
Paper Troubles in Offset Lithography

RESEARCH AND TECHNICAL PUBLICATIONS

The Etching Operation in Lithography
The Light Fastness of Lithographic Ink Pigments
Tackiness, Glazing and Engraving of Offset Press Blankets
The Albumin Process of Photolithography
Lithotine, A New Lithographic Solvent
Processes for Making Deep-Etched Zinc Lithographic Plates by Photo and Hand Transfer Methods
Deep-Etched Aluminum and Zinc Lithographic Plates by the Gum Process
Deep-Etched Lithographic Plates Directly from Negatives
Dot-Etching on Dry Plates and Films
Litho-Kleen, an Improved Cleaner and Preservative for Offset Blankets and Rollers
The Drying of Lithographic Ink
Improvements in Deep-Etch Platemaking
Modern Paper Conditioning Methods and Paper Hygroscope
Method of Conditioning Paper for Multi-Color Offset
Optical Density as a Measure of Tone Value in Lithography
The Relations Between Dot Area, Dot Density and Tone Value for Halftone Images
Prevention of Occupational Dematitis in Lithography (Chrome Poisoning)
Curling of Lithographic Papers
Air Conditioning for Lithographers
The Control of Tone Reproduction in Lithography
Improved Desensitization with Cellulose Gum
Directions for Use of Cronak and Brunak
Lithographic Abstracts 1947
The Paper Hygroscope
The Register Rule